

## Aberystwyth University

### *Family Matters*

Ko, Ahra; Pick, Cari M.; Kwon, Jung Yul; Barlev, Michael; Krems, Jaimie Arona; Varnum, Michael E. W.; Neel, Rebecca; Peysha, Mark; Boonyasiriwat, Watcharaporn; Brandstätter, Eduard; Vasquez, Julio Eduardo Cruz; Galindo, Oscar; David, Daniel; Pereira de Felipe, Renata; Crispim, Ana; Fetvadjeiev, Velichko; Fischer, Ronald; Karl, Johannes; Galdi, Silvia; Gomez-Jacinto, Luis

*Published in:*

Perspectives on Psychological Science

*DOI:*

[10.1177/1745691619872986](https://doi.org/10.1177/1745691619872986)

*Publication date:*

2020

*Citation for published version (APA):*

Ko, A., Pick, C. M., Kwon, J. Y., Barlev, M., Krems, J. A., Varnum, M. E. W., Neel, R., Peysha, M., Boonyasiriwat, W., Brandstätter, E., Vasquez, J. E. C., Galindo, O., David, D., Pereira de Felipe, R., Crispim, A., Fetvadjeiev, V., Fischer, R., Karl, J., Galdi, S., ... Savchenko, T. (2020). Family Matters: Rethinking the Psychology of Human Social Motivation. *Perspectives on Psychological Science*, 15(1), 173-201.  
<https://doi.org/10.1177/1745691619872986>

### **General rights**

Copyright and moral rights for the publications made accessible in the Aberystwyth Research Portal (the Institutional Repository) are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Aberystwyth Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Aberystwyth Research Portal

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

tel: +44 1970 62 2400

email: [is@aber.ac.uk](mailto:is@aber.ac.uk)

## Aberystwyth University

### *Family matters: rethinking the psychology of human social motivation*

Ko, Ahra; Pick, Cari; Kwon, Jung Yul; Barlev, Michael; Krems, Jaimie; Varnum, Michael; Neel, Rebecca; Peysha, Mark; Boonyasiriwat, Watcharaporn; Brandstätter, Eduard; Vasquez, Julio ; Galindo, Oscar; David, Daniel; Pereira de Felipe, Renata; Crispim, Ana; Fetvadjiev, Velichko; Fischer, Ronald; Karl, Johannes; Galdi, Silvia; Gomez-Jacinto, Luis

*Published in:*

Perspectives on Psychological Science

*Publication date:*

2019

*Citation for published version (APA):*

Ko, A., Pick, C., Kwon, J. Y., Barlev, M., Krems, J., Varnum, M., ... Kenrick, D. (Accepted/In press). Family matters: rethinking the psychology of human social motivation. Perspectives on Psychological Science.

#### **General rights**

Copyright and moral rights for the publications made accessible in the Aberystwyth Research Portal (the Institutional Repository) are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Aberystwyth Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Aberystwyth Research Portal

#### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

tel: +44 1970 62 2400

email: [is@aber.ac.uk](mailto:is@aber.ac.uk)

**Family Matters:  
Rethinking the Psychology of Human Social Motivation**

Ahra Ko<sup>1</sup>, Cari M. Pick<sup>1</sup>, Jung Yul Kwon<sup>1</sup>, Michael Barlev<sup>1</sup>, Jaimie Arona Krems<sup>2</sup>, Michael E. W. Varnum<sup>1</sup>, Rebecca Neel<sup>3</sup>, Mark Peysha<sup>4</sup>, Watcharaporn Boonyasiriwat<sup>5</sup>, Eduard Brandstätter<sup>6</sup>, Julio Eduardo Cruz Vasquez<sup>7</sup>, Oscar Galindo<sup>7</sup>, Daniel David<sup>8</sup>, Renata Pereira de Felipe<sup>9</sup>, Ana Carla Crispim<sup>9</sup>, Velichko H. Fetvadjiev<sup>10</sup>, Ronald Fischer<sup>10</sup>, Johannes Karl<sup>10</sup>, Silvia Galdi<sup>11</sup>, Luis Gomez-Jacinto<sup>12</sup>, Igor Grossmann<sup>13</sup>, Pelin Gul<sup>14</sup>, Takeshi Hamamura<sup>15</sup>, Shihui Han<sup>16</sup>, Hidefumi Hitokoto<sup>17</sup>, Martina Hřebíčková<sup>18</sup>, Sylvie Graf<sup>18</sup>, Jennifer Lee Johnson<sup>19</sup>, Oksana Malanchuk<sup>20</sup>, Asuka Murata<sup>21</sup>, Jinkyung Na<sup>22</sup>, Jiaqing O<sup>23</sup>, Muhammed Rizwan<sup>24</sup>, Eric Roth<sup>25</sup>, Sergio Antonio Salgado Salgado<sup>26</sup>, A. Timur Sevincer<sup>27</sup>, Adrian Stanciu<sup>28</sup>, Eunkook M. Suh<sup>29</sup>, Thomas Talhelm<sup>30</sup>, Ayse K. Uskul<sup>31</sup>, Irem Uz<sup>32</sup>, Danilo Zambrano<sup>33</sup>, Douglas T. Kenrick<sup>1</sup>

<sup>1</sup>Arizona State University, Tempe; <sup>2</sup>Oklahoma State University, Stillwater; <sup>3</sup>University of Toronto, Canada; <sup>4</sup>Robbins-Madanes Training; <sup>5</sup>Chulalongkorn University, Thailand; <sup>6</sup>Johannes Kepler University Linz, Austria; <sup>7</sup>Universidad de los Andes, Colombia; <sup>8</sup>Babeş-Bolyai University, Romania; <sup>9</sup>Instituto de Psicologia at Universidade de São Paulo, Brazil; <sup>10</sup>Victoria University of Wellington, New Zealand; <sup>11</sup>University of Campania Luigi Vanvitelli, Italy; <sup>12</sup>University of Malaga, Spain; <sup>13</sup>University of Waterloo, Canada; <sup>14</sup>Iowa State University, Ames; <sup>15</sup>Curtin University, Australia; <sup>16</sup>Peking University, China; <sup>17</sup>Kyoto University, Japan; <sup>18</sup>Czech Academy of Sciences, Czech Republic; <sup>19</sup>Purdue University, West Lafayette; <sup>20</sup>University of Michigan, Ann Arbor; <sup>21</sup>Hokkaido University, Japan; <sup>22</sup>Sogang University, South Korea; <sup>23</sup>Aberystwyth University, U.K.; <sup>24</sup>University of Karachi, Pakistan; <sup>25</sup>Universidad Católica Boliviana, Bolivia; <sup>26</sup>Universidad de La Frontera, Chile; <sup>27</sup>University of Hamburg, Germany; <sup>28</sup>Bremen International School of Social Sciences, Germany; <sup>29</sup>Yonsei University, South Korea; <sup>30</sup>University of Chicago Booth School of Business, Chicago; <sup>31</sup>University of Kent, U.K.; <sup>32</sup>TOBB University of Economics and Technology, Turkey; <sup>33</sup>Fundación Universitaria Konrad Lorenz, Colombia

**Acknowledgement.** The contributions of Michael E. W. Varnum and Douglas T. Kenrick were supported by grant #1822713 from the *National Science Foundation*. The contributions of Ana Carla Crispim and Renata Pereira de Felipe were supported by funding from *FAPESP (São Paulo Research Foundation)*. The contributions of Martina Hřebíčková and Sylvie Graf were supported by grant #17-14387S from the *Czech Science Foundation* and by RVO: 68081740 of the *Institute of Psychology, Czech Academy of Sciences*. **NOTE: Not for quotation, as the final version of this article, to appear in *Perspectives on Psychological Science* may differ slightly.**

Correspondence concerning this article should be addressed to  
Douglas T. Kenrick & Michael E. W. Varnum  
Department of Psychology  
Arizona State University  
950 South McAllister Street, Tempe, AZ 85287-1104.  
E-mail: douglas.kenrick@asu.edu; mvarnum@asu.edu

### Abstract

What motives do people prioritize in their social lives? Historically, social psychologists, especially those adopting an evolutionary perspective, have devoted a great deal of research attention to sexual attraction and romantic partner choice (mate-seeking). Research on long-term familial bonds (mate retention and kin care) has been less thoroughly connected to relevant comparative and evolutionary work on other species, and in the case of kin care, less well researched. Examining varied sources of data from 27 societies around the world, we found that people generally view familial motives as primary in importance, and mate-seeking motives as relatively low in importance. College students, single people, and males place relatively higher emphasis on mate-seeking, but even those samples rated kin care motives as more important. Further, motives linked to long-term familial bonds are positively associated with psychological well-being, but mate-seeking motives are associated with anxiety and depression. We address theoretical and empirical reasons why there has been extensive research on mate-seeking, and why people prioritize goals related to long-term familial bonds over mating goals. Reallocating relatively greater research effort toward long-term familial relationships would likely yield many interesting new findings relevant to everyday people's highest social priorities.

**Family matters: Rethinking the psychology of human social motivation**

Which aspects of their social lives do people think are most important? Which domains of their social lives do people associate with meaningful and fulfilling lives? What makes people happy as opposed to miserable? What are the most important social rules about? Along with a number of colleagues, we have been delving into questions involving fundamental human social motives over the last two decades (Kenrick, Griskevicius, Neuberg, & Schaller, 2010; Kenrick, Li, & Butner, 2003; Kenrick, Neuberg, Griskevicius, Becker, & Schaller, 2010; Maner et al., 2005; Neel, Kenrick, White, & Neuberg, 2016). We use the term “fundamental” very specifically here—to mean domain-specific motives that are likely to have been linked to universal and recurrent problems and opportunities faced by our human ancestors (Kenrick et al., 2010; Schaller, Neuberg, Griskevicius, & Kenrick, 2010; Schaller, Kenrick, Neel, & Neuberg, 2017). Recently, we have begun investigating how these fundamental social motives might be associated with psychological well-being and self-actualization (Kenrick & Krems, 2018; Ko & Suh, 2019; Krems, Kenrick, & Neel, 2017), and how such associations might hold across different societies around the world (Pick, Ko, Kenrick, Varnum et al., 2019).

In considering the question of which social motives are fundamental to human beings, our research has been guided by ideas from evolutionary life history theory (e.g., Kenrick et al., 2010). Given that humans’ social motives have been shaped by recurrent adaptive challenges and opportunities, the fundamental social motives approach focuses on qualitatively distinct social goals that humans pursue to manage those challenges and opportunities. The strategies involved in successfully cooperating with friends, romantic partners, and family members, for example, are likely to be different in important ways (Kenrick, Sundie, & Kurzban, 2008).

From the perspective of evolution by natural selection, reproduction is critical for all living organisms. Obviously, one essential aspect of reproduction is finding a sexual partner. If they were successful at nothing else, every one of our ancestors was successful at finding at least one sexual partner.

For decades preceding the advent of an evolutionary perspective in social psychology, researchers have devoted substantial attention to various facets of sexual attraction and romantic partner choice (Berscheid, Dion, Walster, & Walster, 1971; Byrne, 1976; Byrne, Ervin, & Lambert, 1970; Dutton & Aron, 1974; Snyder, Tanke, & Berscheid, 1977). Research in this area has revealed a great deal about which characteristics people find desirable in romantic/sexual partners, for example, as well as how those characteristics vary for men versus women, and for those seeking short-term versus long-term partners (e.g., Buss, 1994; Cunningham, Druen, & Barbee, 1997; Feingold, 1992; Fletcher et al., 1999; Gangestad & Simpson, 2000; Li, Bailey, Kenrick, & Linsenmeier, 2002; Perilloux, Webster, & Gaulin, 2010; Reis et al., 1982; Simpson, Gangestad, Christensen, & Leck, 1999). A glance at almost any modern social psychology textbook will likely reveal a chapter on attraction, with much of that chapter focusing on sexual attraction and romantic love (e.g., Gilovich, Keltner, Chen, & Nisbett, 2016; Kenrick, Neuberg, Cialdini, & Lundberg-Kenrick, 2019; Myers, 2013). In such textbooks, the discussion of sexual attraction is almost certain to include a consideration of the evolutionary significance of the various features that people find desirable. Indeed, if an evolutionary perspective is included anywhere in a social psychology textbook, it is most likely to be found in the discussion of sexual attraction.

In light of the importance that evolutionary social psychologists (including the corresponding author of this paper) have placed on sexual attraction and romantic partner choice,

we were a bit surprised by a pattern we observed in several of the data sets we have been collecting on the topic of fundamental social motives. As one example, consider the results of a study in which 3,214 adults were asked to rate which social goals were most important in their lives (Ko, Krems, Peysha, & Kenrick, 2019).

These participants were first asked to fill out the Fundamental Social Motives Inventory (Neel et al., 2016). Table 1 gives examples of items on that scale.

*Table 1. Fundamental Social Motives Inventory (Neel et al., 2016), selected items*

<b>Subscale</b>	<b>Sample item</b>
Self-Protection	I think a lot about how to stay safe from dangerous people.
Disease Avoidance	I avoid people who might have a contagious illness.
Affiliation ( <i>Group</i> )	I like being part of a team.
Affiliation ( <i>Independence</i> )	I would prefer to spend time alone rather than being surrounded by other people.
Affiliation ( <i>Exclusion Concern</i> )	I would be extremely hurt if a friend excluded me.
Status-Seeking	I want to be in a position of leadership.
Mate-Seeking	I am interested in finding a new romantic/sexual partner.
Breakup Concern	I often think about whether my partner will leave me.
Mate Retention	It is important to me that my partner is emotionally loyal to me.
Kin Care ( <i>Family</i> )	Caring for family members is important to me.
Kin Care ( <i>Children</i> )	I like to spend time with my children.

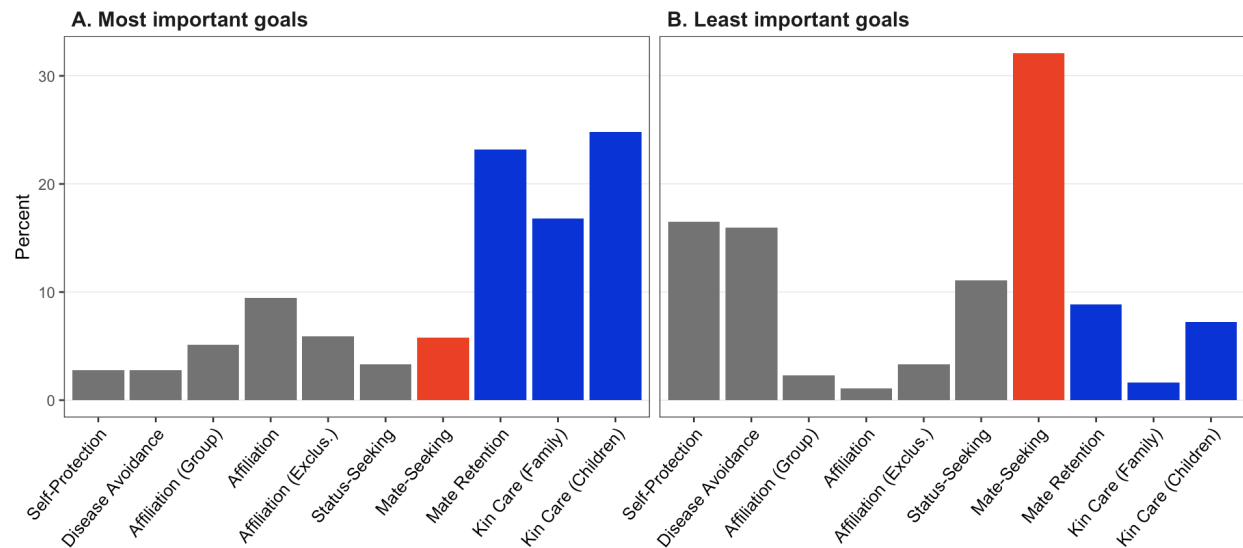
After filling out the Fundamental Social Motives Inventory, participants were shown a list of ten different goals roughly corresponding to those same motives, and they were asked to rank those goals according to their importance in their current lives (using summary labels as shown in Table 2).

*Table 2. List of goals participants were asked to rank in terms of their importance to them in their current lives.*

<b>Goals</b>	<b>Description</b>
Self-Protection	Staying safe from dangerous people
Disease Avoidance	Avoiding disease
Affiliation ( <i>Group</i> )	Being part of a group or team
Affiliation	Spending time with friends
Affiliation ( <i>Exclusion Concern</i> )	Being accepted and included
Status-Seeking	Having others respect my status
Mate-Seeking	Finding a new romantic/sexual partner
Mate Retention	Staying with a romantic/sexual partner long-term
Kin Care ( <i>Family</i> )	Spending time with and helping parents, siblings, or other relatives
Kin Care ( <i>Children</i> )	Taking care of a child/children

Figure 1 shows the goals that participants ranked as highest in personal importance (on the left), and those that they ranked as lowest in personal importance (on the right).





**Figure 1.** Goals that a sample of  $N = 3,214$  adults rated as (1A) most important (i.e., top two goals) versus (1B) least important (i.e., bottom two goals) in their current lives (Ko, Krems, Peysha & Kenrick, 2019; See Figure S1 in the Supplement for the complete set of rankings).

When we examined how people ranked the importance of these different goals in their lives, one striking pattern stood out. As shown on the right half of the graph, people overwhelmingly ranked mate-seeking as the *least* important motive (Figure 1B, red bar). The left half of the graph, by contrast, indicates that the goals linked to long-term familial bonds (mate retention and kin care; Figure 1A, blue bars) stood out as the *most* important goals in people's current lives. Mate-seeking, by contrast, was rarely chosen as most important (Figure 1A, red bar; See supplement for the full rank order of each of the goals).

At first glance, there certainly seems to be some discrepancy between the goals given priority by participants in this sample, and the relative priorities that social and evolutionary psychologists have historically given to these different topics (e.g., Daly, Salmon, & Wilson, 1997; Webster, Jonason, & Schember, 2009). Figure 2 shows a word cloud from an article titled,

[illegible]

In a completely different research area—the study of positive emotions—a recent review concludes that sexual desire has received a great deal of research investigation, whereas nurturant love and attachment love (emotions linked to kin care and mate retention) have been relatively less well studied (Shiota et al., 2017).

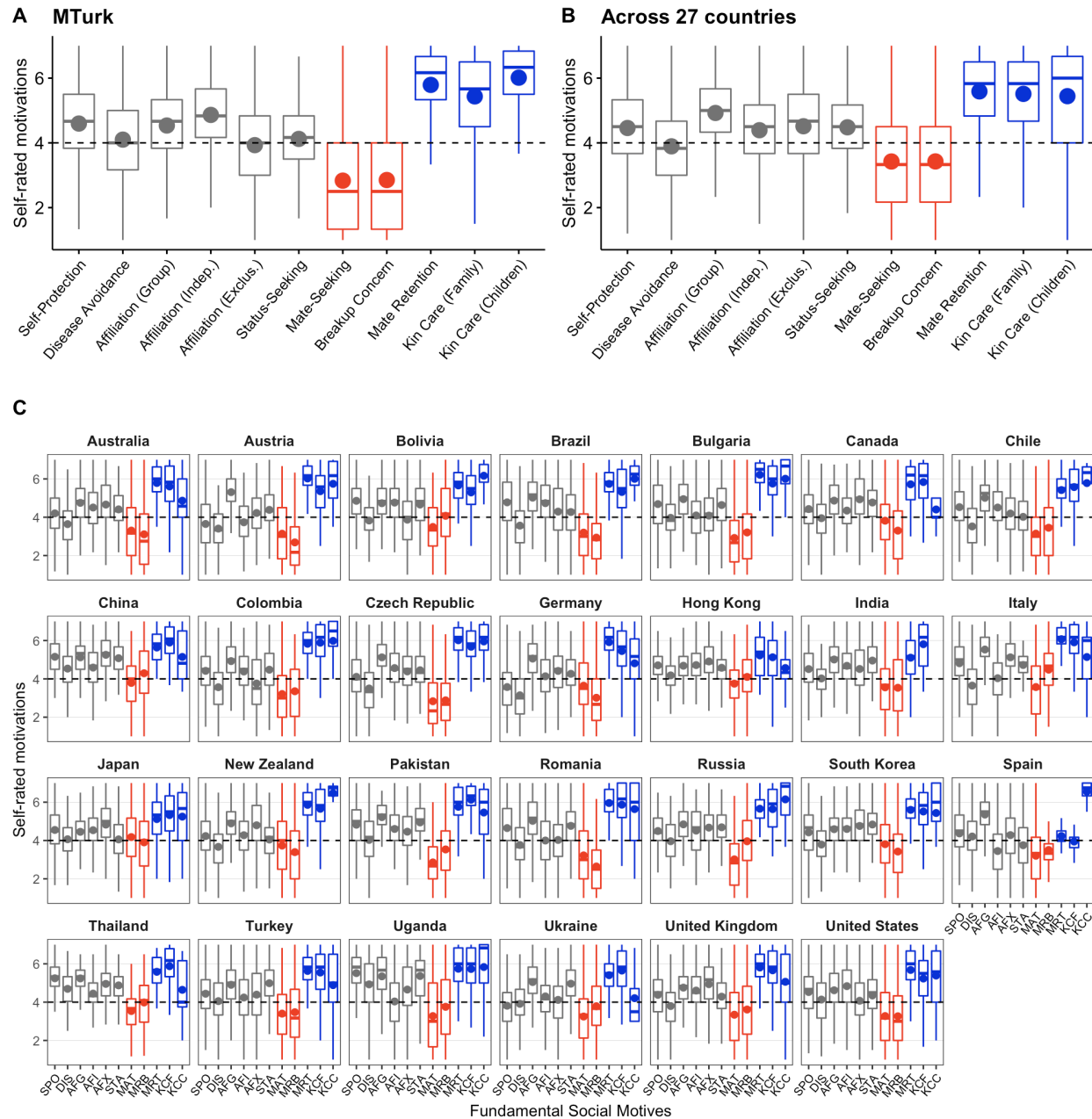
This pattern captured our attention because members of our team have published articles in mainstream social psychology and evolutionary psychology journals and have authored a social psychology textbook, and the ratio of our own coverage of mate-seeking as opposed to kin care and mate retention has certainly been in line with the historical biases of many other evolutionarily-oriented social psychologists—relatively high coverage of sexual attraction compared to lower coverage of long-term familial relationships (e.g., Anderson et al., 2010;

Griskevicius, Cialdini, & Kenrick, 2006; Kenrick & Gutierres, 1980; Kenrick & Cialdini, 1977; Kenrick, Gutierres, & Goldberg, 1989; Kenrick, Stringfield, Wagenhals, Dahl, & Ransdell, 1980; Kenrick & Keefe, 1992; Li & Kenrick, 2006; Maner et al., 2003; White, Kenrick, & Neuberg, 2013, but see Ackerman, Kenrick, & Schaller, 2007). Our first thought was that perhaps the sample whose results are depicted in Figure 1 is not representative of the wider population, in ways that could uniquely affect the relative unimportance they placed on mate-seeking as compared to the especially high importance they placed on mate retention and kin care. More than two-thirds of these participants were female, in committed relationships, or had children. The average age of participants in that sample was 47 years old ( $SD = 11.83$ ). Perhaps most importantly, the sample was drawn from a population of people interested in life coaching.

To investigate the possibility that these results might be unique to this particular sample, we revisited data from several previous studies of fundamental motives conducted with broader American samples, and also examined more recent cross-cultural samples from 27 different countries. Figure 3A presents the means for the different motives from the Amazon's Mechanical Turk (MTurk) sample used in the original study of individual differences in fundamental social motives (Neel et al., 2016;  $N = 1,560$ ,  $M_{age} = 34.25$ ,  $SD = 12.59$ ). Once again, it is noteworthy how relatively low mate-seeking was rated (red), and how relatively high mate retention and kin care motives were (blue). People in this broader sample again tended to score higher on mate retention and kin care motivations than on mate-seeking and breakup concern motivations. Breakup concern was not measured in the life coaching sample, and therefore not included in the ranking of motives shown in Figure 1, but we have highlighted it here because both mate-seeking and breakup concern might be regarded as motives active when one is in an uncertain or unfulfilled state with regard to a long-term relationship. By contrast, mate retention and kin care

motives are likely to be active when one is in a long-term relationship that is perceived as stable, committed, or permanent (in the case of kin relationships, particularly).

Figure 3B depicts the analogous results for a much broader sample of 7,296 people in 27 countries (Varnum, Kenrick, Pick, Ko et al., 2019;  $M_{age} = 24.03$ ,  $SD = 8.14$ ). Within each of the 27 societies—countries ranging from the United States to Uganda—we found the same pattern of results (Figure 3C). Namely, people around the globe rate kin care and mate retention motives as higher than mate-seeking motives.



**Figure 3.** (3A) Fundamental Social Motive Inventory results from Neel et al. (2016), which used an MTurk sample ( $N = 1,560$ ). (3B) Fundamental Social Motive Inventory results from ongoing global data collection from 27 countries ( $N = 7,296$ ; Varnum et al., 2019) aggregated across all countries, and (3C) the same data separated by each country. For each of the graphs, the horizontal bar and circle within each box represent median and mean, respectively. The dashed line indicates the scale midpoint. Breakup concern and mate retention questions were asked only

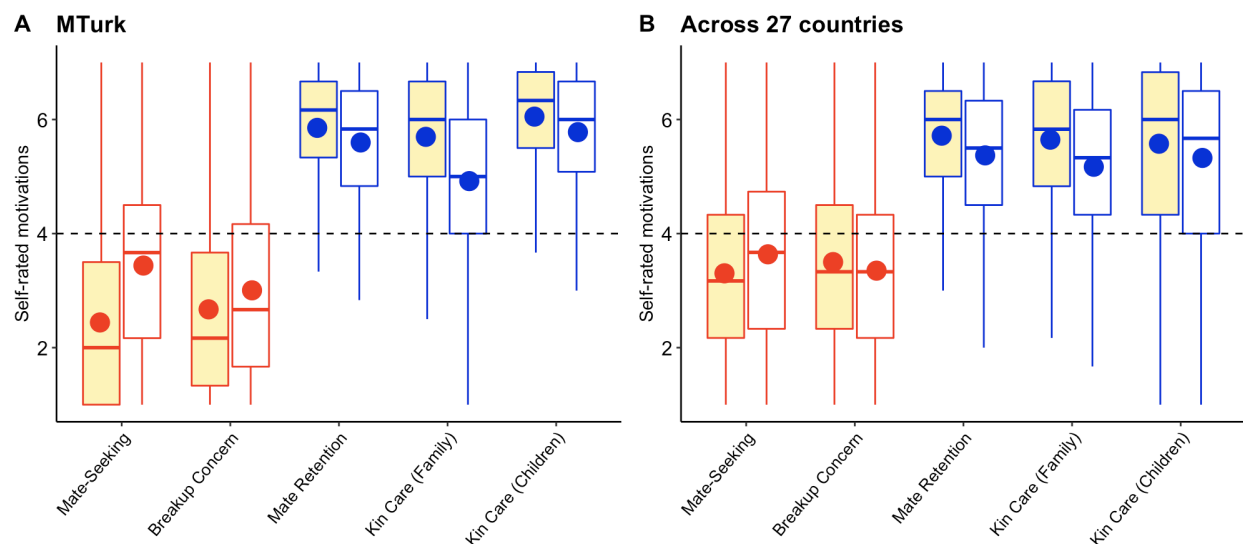
to participants in relationships. Kin care (*children*) questions were asked only to participants who have children. *Note for Figure 3C: SPO = Self-protection, DIS = Disease Avoidance, AFG = Affiliation (Group), AFI = Affiliation (Independence), AFX = Affiliation (Exclusion Concern), STA = Status, MAT = Mate-Seeking, MRB = Breakup Concern, MRT = Mate Retention, KCF = Kin Care (Family), KCC = Kin Care (Children).*

### **Potential moderators and boundary conditions? Sex, age, and relationship status**

After observing similar results across several diverse samples, we considered several possible factors that might reverse the general pattern, leading some people to rate mate-seeking motives relatively higher than motives related to long-term familial bonds. Three obvious candidates were participants' sex, their age, and whether they were single or in a committed relationship.

**Sex.** A great deal of research on sexual attraction and mate-seeking has revealed robust sex differences in these motivational domains. On average, men tend to express relatively more interest in casual sexual relationships, and women tend to express relatively more interest in long-term committed relationships (Buss & Schmitt, 1993; Clark & Hatfield, 1989; Gangestad & Simpson, 2000; Kenrick, Groth, Trost, & Sadalla, 1993; Li et al., 2002; Schmitt, 2005). Figure 4 shows the focal mate-seeking and breakup concern goals (red) and familial bonds goals (blue) separately for men (shaded white) and women (shaded yellow) from the results for the Neel et al. (2016) MTurk sample (Figure 4A) and from the Varnum et al. (2019) sample of 27 different countries (Figure 4B). In both studies, consistent with an abundance of previous findings, men were significantly higher on mate-seeking motivation than were women (Neel et al:  $d = 0.55$ , Varnum et al:  $d = 0.24$ ). Further, consistent with other social psychological findings (Buckels et

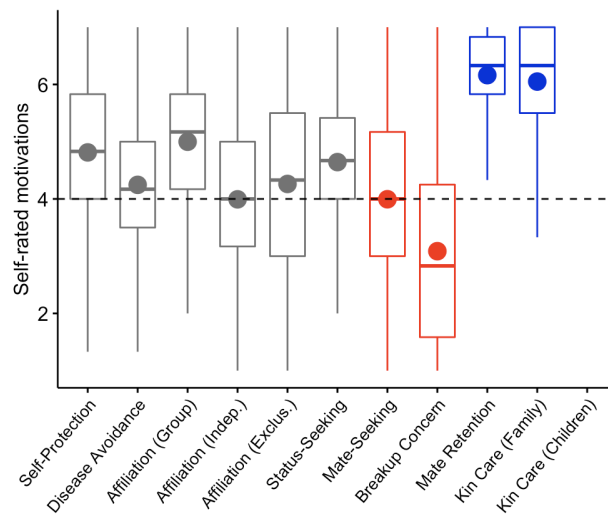
al., 2015; Hofer, Buckels, White, Beall, & Schaller, 2018; Neel et al., 2016), women scored significantly higher on mate retention (Neel et al:  $d = 0.41$ , Varnum et al:  $d = 0.31$ ), kin care (*family*) (Neel et al:  $d = 0.47$ , Varnum et al:  $d = 0.35$ ), and kin care (*children*) (Neel et al:  $d = 0.28$ , Varnum et al:  $d = 0.18$ ) than did men. Nevertheless, those sex differences, though statistically reliable, appear small in this context, because they are dwarfed by the overall differences between mate-seeking versus familial bonding motives. The effect sizes were indeed quite large for paired comparisons between mate-seeking and kin care (*family*) (Neel et al:  $d = 1.78$ , Varnum et al:  $d = 1.54$ ) and between mate-seeking and kin care (*children*) (Neel et al:  $d = 3.21$ , Varnum et al:  $d = 1.67$ ).



**Figure 4.** Boxplot of self-rated motivations related to mate-seeking and breakup concern (red) and familial bonds (blue), separated by female (shaded yellow) and male (shaded white) participants. Results from (4A) Neel et al. (2016) focal study, and (4B) an ongoing global data collection from 27 countries (Varnum et al., 2019).

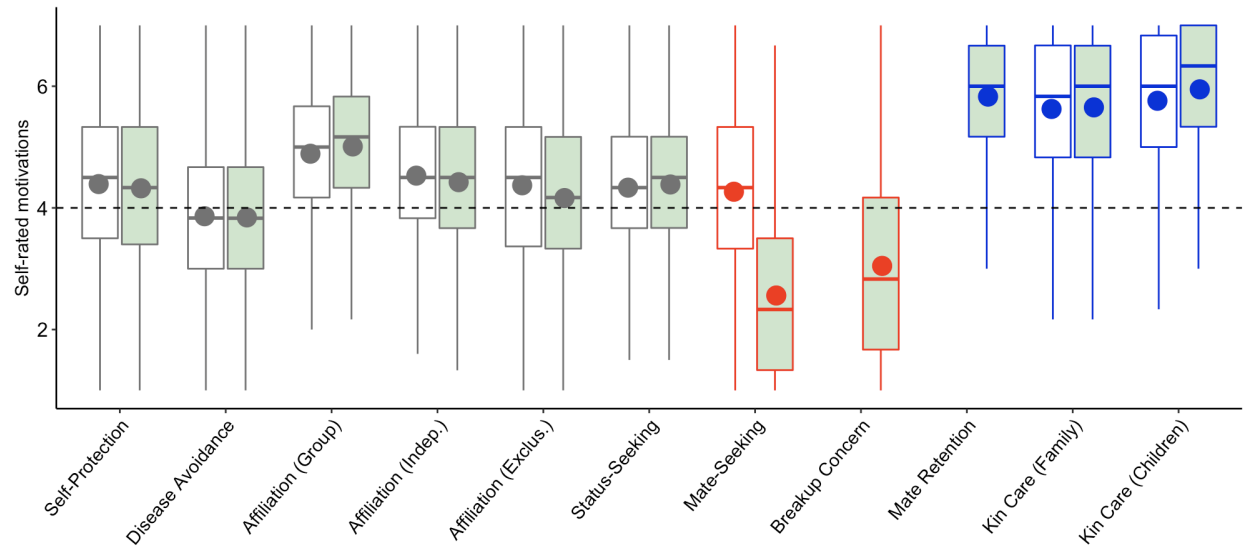
**College students.** College students have historically been the main population studied by psychologists (Henrich, Heine, & Norenzayan, 2010). This is certainly true for studies of sexual attraction and mating motivation (e.g., Griskevicius et al., 2006, 2009, 2007; Sundie et al., 2011). However, college students may differ from the larger population because they are at a life stage where seeking a mate is especially important. Indeed, when we examined data from an independent sample of American undergraduate students ( $N = 497$ ,  $M_{age} = 19.15$ ,  $SD = 1.50$ ; Ko & Barlev, 2019; Figure 5), the students' scores on the mate-seeking motive were significantly higher than those seen in the other samples. If one compares the results in Figure 5 to those in Figure 3, one can see that mate-seeking is a stronger motivation in this college sample than among the more representative and, on average, older samples previously discussed. Nevertheless, even though mate-seeking increased in importance in this undergraduate sample, kin care (*family*) and mate retention are still much stronger motivations than mate-seeking ( $ds = 1.52$  and  $3.55$ , respectively). Kin care (*children*) was not relevant here, since the majority of these college students did not have children, and those items were therefore not administered to this sample.





**Figure 5.** Fundamental Social Motive Inventory results for undergraduate students at a large state university ( $N = 497$ ; Ko & Barlev, 2019).

**Relationship status.** Of course, many college students and older adults are already in long-term relationships, and those in relationships are likely to be less concerned with seeking new partners. Perhaps the most relevant life history comparison would be to compare the data for those in long-term relationships to those who are not. To address this question, we collapsed data across the various samples mentioned so far (Total  $N = 12,046$ ) and examined the strength of the various fundamental motives as a function of participants' relationship status (Figure 6).



**Figure 6.** Fundamental Social Motive Inventory results from the aggregated data set, separated by participants in long-term relationships (shaded green;  $n = 6,869$ ) and those who are not (shaded white;  $n = 5,177$ ). Note: Breakup concern or mate retention items were not relevant to individuals not in relationships.

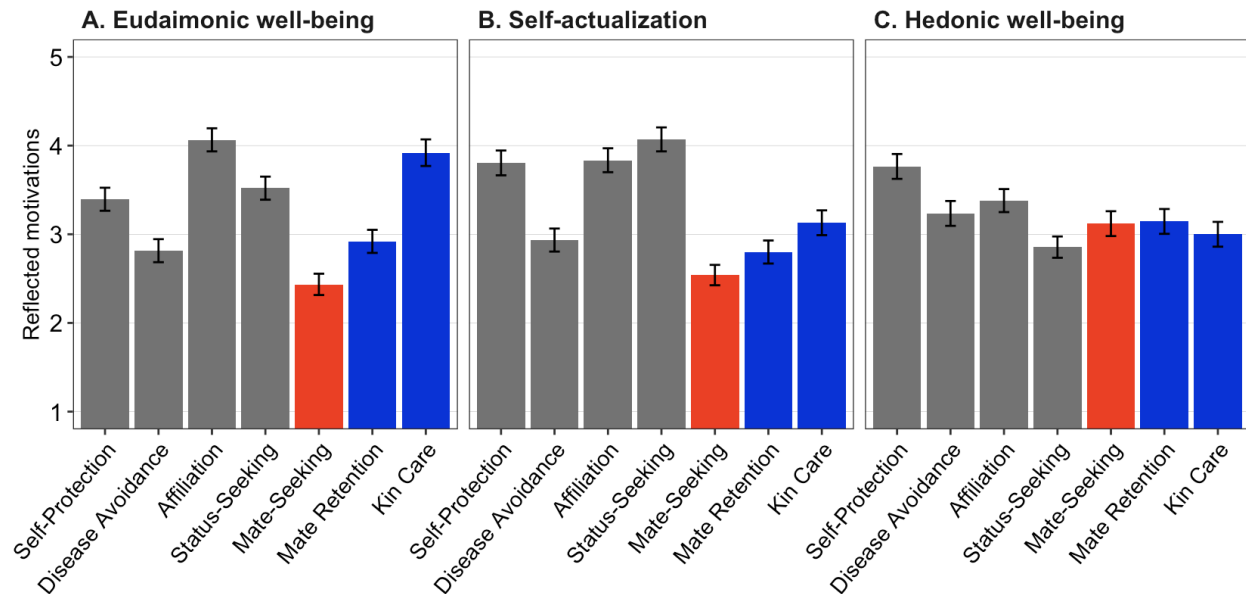
We indeed observed sizeable differences in mate-seeking motivation between participants who were in committed relationships compared to those who were not ( $d = 1.21$ ). For those in committed relationships, mate-seeking motivation was well below the mid-point of the scale, whereas for those who were *not* in long-term relationships, mate-seeking was above the midpoint of the scale—at a comparable level to several other motives such as self-protection and various aspects of affiliation, and higher than disease avoidance. Of course, it makes eminent sense that mate-seeking is a more important motivation for those who are not in relationships. And yet it is noteworthy that even among single people, kin care (*family*) motivation is still substantially higher than mate-seeking motivation ( $d = 1.03$ ).

**Positivity versus negativity of mate-seeking and family values**

A plausible concern about the findings presented here is that the Fundamental Social Motives Inventory might be comprised of items written such that mating items are less appealing to endorse than familial bonds items. However, the results for the study shown in Figure 1 were obtained using a different method than the results for the studies shown in Figures 3 through 5 (which were measured with the Fundamental Social Motives Inventory), yet show the same pattern. For that first study, people were asked to rank brief descriptions of the different goals according to their personal importance (using the summary terms shown in Table 2). Furthermore, and lending support to the notion that people may be accurately reflecting their motivational priorities, the results depicted in Figure 6 indicate that, as expected, people who are single do indeed report levels of mate-seeking equivalent to several other motives.

Perhaps, on the other side of the equation, familial bonds motives are simply strongly associated with general positivity and social desirability. That makes some sense, but other data sets suggest that the relationship between those motives and positivity is not quite so simple.

**Psychological well-being and the fundamental social motives.** Figure 7 depicts results from a study in which participants were asked what they would be doing right now if they were pursuing: 1) “eudaimonic well-being, which is about finding meaning and purpose in life,” 2) “self-actualization, which is about fully realizing your own potential,” and 3) “hedonic well-being, which is about maximizing the amount of pleasure in your life (and minimizing the amount of pain)” (Krems et al., 2017). Those participants ( $N = 565$ ,  $M_{age} = 37.97$ ,  $SD = 13.00$ ) were then asked to consider the extent to which their answers reflected the different motives (using summary descriptions similar to those shown in Table 2, except that the different facets of affiliation and kin care were not distinguished).



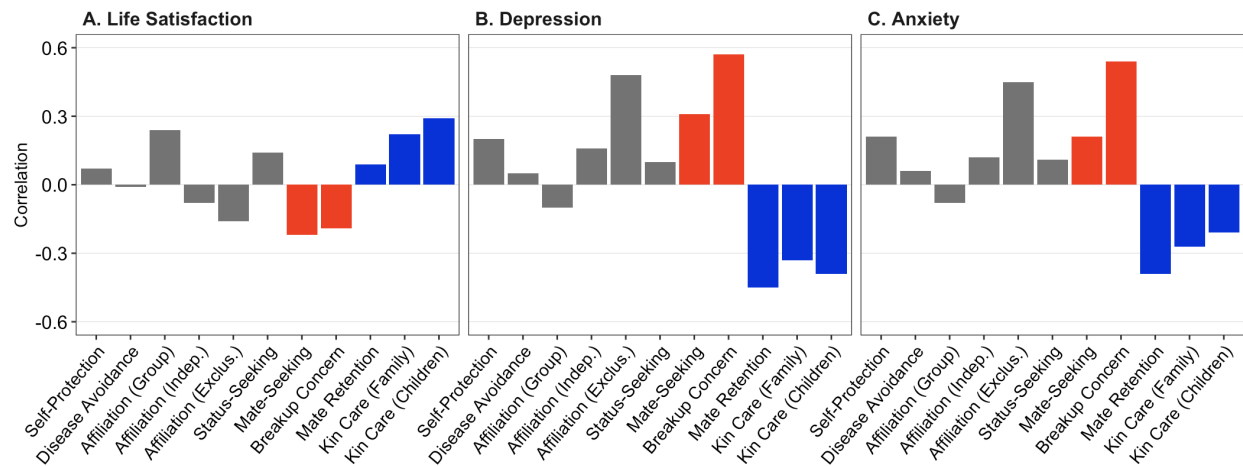
**Figure 7.** Results from Krems, Kenrick, & Neel (2017) Study 2, displaying which motives participants said they would be focused on right now if they were pursuing one of three different types of well-being; (A) Eudaimonic well-being (i.e., finding meaning and purpose in life), (B) Self-actualization (i.e., fully realizing their own potential), and (C) Hedonic well-being (i.e., maximizing pleasure and minimizing pain).

With regard to meaning in life (eudaimonic well-being; Figure 7A), mate-retention and kin care were again rated more highly than mate-seeking, but the overall pattern for other motives was rather different from that presented in our first five figures. Across the three types of well-being, affiliation was seen as substantially higher in importance than was mate retention, for example. With regard to self-actualization (Figure 7B), there was another distinct pattern: mate-seeking was again rated as relatively irrelevant, but status motives rose to the top in importance, and neither mate retention nor kin care were seen as being of paramount importance. For hedonic well-being (Figure 7C), there was yet another distinct pattern: mate-seeking rose

from its position of relative unimportance, and was here rated as equivalent in importance to mate retention and kin care motives. Kin care's lower relevance to hedonic well-being as compared to eudaemonic well-being mirrors other findings that parents experience relatively low moment-to-moment positivity in contact with their children, but an overall higher level of happiness and meaning in life (e.g., Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Nelson, Kushlev, English, Dunn, & Lyubomirsky, 2013). Thus, there is certainly not a simple positivity/negativity bias in the mate-seeking and familial bonds motives across the different types of psychological well-being.

In another study (Varnum, Kenrick, Pick, & Ko, 2019), we explored the links between scores on fundamental social motives and several measures of psychological well-being and distress, such as life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985), depression (Baron, Davies, & Lund, 2017), and anxiety (Spitzer, Kroenke, Williams, & Löwe, 2006) in an MTurk sample ( $N = 263$ ,  $M_{age} = 34.87$ ,  $SD = 11.21$ ; see Figure 8). People who reported higher levels of kin care (*family*) and kin care (*children*) motivation were more satisfied with their lives ( $r_s = .22$  and  $.29$ , respectively,  $ps < .001$ ; Figure 8A). They reported being less depressed ( $r_s = -.33$  and  $-.39$ , respectively,  $ps < .001$ ; Figure 8B), and less anxious ( $r = -.27$ ,  $p < .001$ , and  $r = -.21$ ,  $p = .01$ , respectively; Figure 8C). In contrast, people who reported high levels of mate-seeking motivation were less satisfied with their lives ( $r = -.22$ ,  $p < .001$ ), while being more depressed ( $r = .31$ ,  $p < .001$ ) and more anxious ( $r = .21$ ,  $p = .001$ ). This pattern may be associated with feeling lonely or experiencing difficulties finding a mate. Similarly, people who reported higher levels of breakup concern were also less satisfied with their lives ( $r = -.19$ ,  $p = .007$ ), more depressed ( $r = .57$ ,  $p < .001$ ) and more anxious ( $r = .54$ ,  $p < .001$ ). Thus, higher kin care motivation is

associated with feelings of psychological well-being, whereas being concerned with finding or keeping mates is associated with relatively more distress and lower life satisfaction.

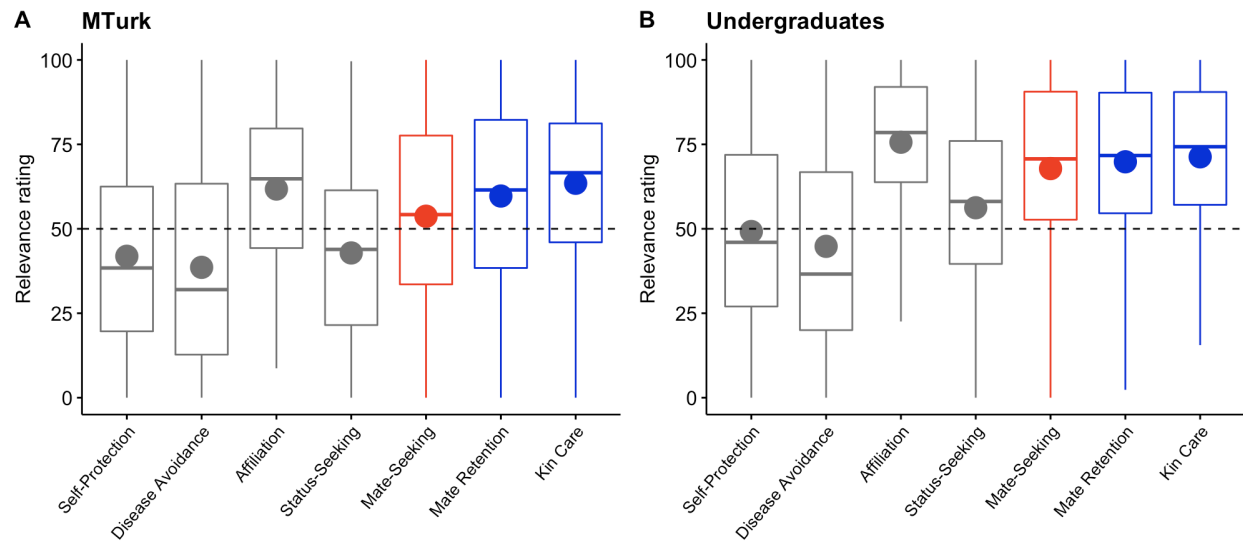


**Figure 8.** Correlations between fundamental social motives and (A) life satisfaction, (B) depression, and (C) anxiety in an MTurk sample ( $N = 263$ ; Varnum, Kenrick, Pick, & Ko, 2019).

**Social rules and fundamental social motives.** Another study found yet a different ordering of the importance of different social motives. In that study, concerned with the formal and informal rules that govern people's social lives, participants were asked about the degree to which they thought important social rules were relevant for achieving goals associated with fundamental social motives (Kwon, Barlev, Kenrick, & Varnum, 2019). Participants in this study first filled out the Fundamental Social Motives Inventory, and then were asked to free-list ten specific rules, guidelines, and/or principles that are important to them. Afterwards, they saw short descriptors capturing the goals associated with each fundamental social motive, and were asked to rate each rule on how relevant it was for achieving each goal (from 0 - *least relevant*, to 100 - *most relevant*).

Across each participant's ten rules, we aggregated their ratings of the rules' relevance to each fundamental social motive, to provide a general measure of what the participant perceived those rules to be for. As shown in Figure 9, an MTurk sample ( $N = 139$ ,  $M_{\text{age}} = 35.68$ ,  $SD = 10.96$ ) rated their self-generated important rules to be more relevant to kin care than to mate-seeking ( $d = 0.37$ ,  $p < .001$ ). A younger, undergraduate sample ( $N = 161$ ,  $M_{\text{age}} = 19.04$ ,  $SD = 1.34$ ) rated their rules to be most relevant to affiliation, but kin care was still rated as second-most relevant. College students, compared to the MTurk sample, also rated the rules to be slightly more relevant to mate-seeking, so that the difference in relevance between mate-seeking and kin care was smaller ( $d = 0.15$ ,  $p = .034$ ; Figure 9). The general pattern of these rankings did not change when we examined the ratings separately for men versus women, nor separately for single people versus those in committed relationships.

It is worth pointing out that participants were not asked to rate how relevant their self-generated rules were for the pursuit of their own personal goals, and that participants did not appear to be merely projecting their own motivations onto these rules. The correlations between an individual's scores on fundamental each motive with his or her corresponding rating of rule relevance to that motive were fairly modest and inconsistent. These correlations suggest that this measure of the perceived function of social rules is not simply another way of measuring which motives are important to each individual.



**Figure 9.** Mean participant ratings of (9A) MTurk workers ( $N = 139$ ) and (9B) undergraduates ( $N = 161$ ) of the degree to which their self-generated important social rules were relevant to each of fundamental social motives (Kwon, Barlev, Kenrick, & Varnum, 2019).

### Interim Summary

To summarize thus far: Using qualitatively different measures and questionnaires, we found consistent and converging patterns in samples varying in sex, age, relationship status, and cultural background, which suggest that: 1) In their current lives, people place substantially lower importance on mate-seeking motives compared to motives linked to long-term familial bonds, 2) People report lower overall levels of mate-seeking motivation compared to motivation linked to long-term familial bonds, 3) People's mate retention and kin care motives, compared to mate-seeking motives, are more likely to be seen as related to the pursuit of a meaningful and fulfilling life, 4) Higher motivation for familial bonds goals is associated with better psychological well-being whereas higher motivation for mate-seeking goals is associated with greater distress, and 5) Mate retention and kin care are seen as linked to the social rules that



people find important in their lives. Mate-seeking is also prominently linked to important social rules, but more so for college students than for older adults, and to a lesser extent than kin care.

One potential argument for why family-related motives might appear stronger or more relevant than those related to mate-seeking is that social desirability or some other artifact explains the pattern we observe in the various datasets discussed in the present work. Although we cannot definitively rule out this possibility, there are several reasons to believe this is not likely the case. First, in all of the studies discussed here, participants were anonymous and had a reasonable expectation of privacy. Second, we observe the same pattern (higher familial bonds versus mate-seeking motives) across a variety of different measurement instruments and paradigms, including the Fundamental Social Motives Inventory (Neel et al., 2016; Varnum et al., 2019), ranking of the fundamental motive domains by importance (Ko et al., 2019), and ratings of self-generated rules' relevance to accomplishing various fundamental motives (Kwon et al., 2019). Third, we also observe the same general pattern across 27 societies, across student and non-student samples, across men and women, and in comparing people who are single versus in committed relationships. Given that societies differ quite substantially in sociosexuality (Schmitt, 2005) as do different demographic groups within a given society, if social desirability was the major determinant of the results then we would expect the overall pattern not to replicate across these groups. Yet it does, quite consistently. Fourth, it is not the case that mate-seeking always scores lowest among the motives, in fact collapsing across samples using the Fundamental Social Movies Inventory (Neel et al., 2016), we find that mate-seeking is rated as highly as several other motives among single people, that mate-seeking is the 4th most relevant motive dimension (out of 7) to self-generated social rules (Kwon et al., 2019), and that when asked which types of goal pursuit are linked to different types of well-being, people indicated

that mate-seeking is of comparable importance to familial motives for the pursuit of hedonic well-being. Finally, mate retention is not seen as particularly important to either eudaimonic well-being or self-actualization (Krems et al., 2017). Note that there are a plethora of findings indicating that people are not generally unwilling to admit to thinking about sexual or romantic motives. For example, the average college man or woman is willing to admit to having fantasies about sex several times each day (Baumeister, Catanese, & Vohs, 2001; Ellis & Symons, 1990).

Aligned with concerns about social desirability are more general concerns about how self-report methods reflect on deeper “why” questions of people’s motivations. It seems unlikely that people can be trusted to report on the ultimate “why” of the goals about which they are obsessing. But they can report on “what”—in the sense of what preoccupies them on a daily basis. Of course, there are still the usual problems of self-report—e.g., honesty and self-delusion. However, in a classic study of human motivation, men put on a starvation diet began to fantasize about food continually (Keys, Brožek, Henschel, Mickelsen & Taylor, 1950). As just noted, other research shows that undergraduate college students admit to thinking about sex multiple times every day (Baumeister et al., 2001; Ellis & Symons, 1990). Therefore, it is reasonable to trust that people can accurately report on the “what” of their daily motivations, even if they don’t think about, or even understand, how those immediate phenomenological goals are connected their connections to ultimate goals such as inclusive fitness. Men might not connect their desire for status to mate acquisition goals, and are unlikely to connect those goals to ultimate inclusive fitness, for example, but they can tell you if they spend hours a day worrying about status.

Thus, taken together, we suspect that neither social desirability, nor potential idiosyncrasies in the Fundamental Social Movies Inventory, nor other such potential artifacts likely account for the general pattern of results observed across these diverse datasets. We think

it is worth seriously entertaining the possibility that people in all these different samples are telling us something about their actual motivational priorities. That said, it may be worthwhile to assess the relative importance or salience of familial bonds and mate-seeking motives using implicit or behavioral measures in future research.

**Why have social and evolutionary psychologists focused relatively less attention on kin relations in comparison to sex?**

In 1997, Daly, Salmon, and Wilson argued that kinship is a central aspect of social relationships around the world, but that it had been largely ignored by social psychologists. Indeed, they labeled this as a “conceptual hole” in social psychology. As noted earlier, a more recent review of research on the topic of positive emotions also found that sexual desire has received a great deal of research attention, whereas nurturant love and attachment love (both connected to familial bonds) were still relatively less explored (Shiota et al., 2017). Several researchers who adopt an evolutionary perspective have conducted studies on various aspects of kinship (Ackerman, Kenrick, & Schaller, 2007; Laham, Gonsalkorale, & von Hippel, 2005; Lieberman, 2009; Lieberman, Tooby, & Cosmides, 2007; Salmon & Shackelford, 2007). Nevertheless, there has been much more emphasis on sexual attraction and mate choice (Webster et al., 2009). This is worth noting, given that kin selection and inclusive fitness are arguably the most foundational concepts of modern evolutionary approaches to behavior (Abbot et al., 2011; Dawkins, 1979; Eberhard, 1975; Hamilton, 1964; Smith, 1964).

There are several explanations for the ample empirical and theoretical attention towards sexual attraction and romantic partner choice. For one thing, mate acquisition is not only a necessary condition for reproduction, but is also the most causally proximate variable in producing offspring. Of the myriad conditions that a sexually-reproducing organism must meet

to achieve reproductive success, it is perhaps most evident that the production of offspring requires copulation. For many mammals, including humans, a single reproductive episode could be sufficient to produce offspring—i.e., copies of one's genes. And, although parental investment in offspring greatly facilitates their reproductive success, even when investment is lacking, offspring may still survive. For example, although survivorship increases with parental investment (Geary, 2000, 2005), in many animal species there is little to no parental care, and instead much effort is devoted to mating competition and attraction. Therefore, mate acquisition may hold a conceptually privileged status with regard to considerations of reproduction.

Another factor contributing to evolutionary theorists' interest in mate selection and sexual behavior is that comparative evidence of sex differences in mating strategies, and theoretical concepts of differential parental investment and sexual selection, allow researchers to make strong predictions about humans' initial mating choices (Buss & Schmitt, 1993; Daly & Wilson, 1983; Kenrick, Sadalla, Groth, & Trost, 1990; Trivers, 1972). In many ways, humans are unique in comparison to other animals (communication via complex language, construction of complex legal systems and manufactured environments, for example). But with regard to reproduction, human females share the capacity to bear and nurse children with all other female mammals, and differences in parental investment across species have had clear and direct implications for variations in mating strategies.

Given the crucial role that mate acquisition plays in achieving reproductive success, it makes sense that much evolved animal behavior can be attributed to the motivation to attract members of the opposite sex and to maximize the likelihood that one's offspring will themselves survive to reproductive age. In fact, research has linked mate-seeking motivation and strategies to a wide variety of psychological outcomes, including creativity, risk-taking, conformity,

financial decisions, etc. (e.g., Griskevicius et al., 2006; Li, Kenrick, Griskevicius, & Neuberg, 2012; Sundie et al., 2011).

There may also be less theoretical reasons why university-based researchers have devoted so much attention to studying sexual attraction and romantic choice, and those are related to both Henrich, Heine, and Norenzayan's (2010) arguments that psychologists commonly draw conclusions from WEIRD subject samples, and to the cognitive bias known as the "availability heuristic" (judging the prevalence of a phenomenon by how easily it comes to mind, Schwarz et al., 1991; Tversky & Kahneman, 1973). College undergraduates, who constitute the students in many researchers' classes, the assistants in most labs, and the majority of participants in their studies, are in the stage of life when acquiring a romantic partner is a salient goal. Indeed, we find that even though mate-seeking motivation was relatively low compared to other motives throughout one's life course, it did steadily increase from the ages of 18 to 30 years old. Hence, there are several factors that would lead researchers working on college campuses to view mate-seeking as especially important.

Finally, from a methodological standpoint, studying individual judgments is much easier than studying dyads or family groups. Although much social psychological theory and research intrinsically involves multiple persons embedded within a social context, dyadic or group-level data require more complex study designs, expansive dataset collections, and statistically sophisticated data analyses than do individual-level data (Kenny, Kashy, & Cook, 2006). Sexual attraction and mate preferences are, by contrast, processes that can be studied at the individual level, and that can in fact unfold psychologically within the time frame of a laboratory experiment.

**Why family bonds are important to people's everyday lives**

From an evolutionary perspective, human psychology has been shaped to drive goals and behaviors in ways that ultimately resulted in the greatest reproductive fitness for our ancestors. Natural selection favors the allocation of energy in ways that will maximize the greatest *inclusive fitness* (West & Gardner, 2013). That is, individuals are selected to strive to maximize transmission of their genes to future generations; directly through their own reproductive success, as well as indirectly through the reproductive success of other individuals with whom they share genes (their family members).

While attempting to maximize fitness, however, all living organisms face the problem of limited resources. Life history theory provides a framework that addresses how organisms allocate their limited time and energy to attaining reproductive success, given necessary trade-offs (Charnov, 1993; Kaplan & Gangestad, 2015; Kenrick & Griskevicius, 2015; Sterns, 1992). For instance, any energy allocated toward future reproductive opportunities, such as growing and maintaining one's own bodily and social capital, is energy that cannot be allocated toward immediate reproduction. Allocating energy toward producing higher numbers of offspring reduces the energy allocated toward enhancing the fitness of individual offspring, because investing resources in each additional offspring necessarily reduces average investment per offspring. In turn, allocating energy toward finding additional mating partners reduces the energy that can be invested in existing offspring.

Cross-species comparisons reveal myriad possible balances in these fundamental trade-offs. Compared to most other mammals, primates have a slow life history, characterized by delayed maturity, slower reproduction, fewer offspring, and longer life expectancy (Jones, 2011). Humans, who generally fall at the slow end of the spectrum—even among primates—have an

extended period of juvenile dependence, later age at first reproduction, extensive biparental care, and supportive child care by older post-reproductive individuals (Kaplan, Hill, Lancaster, & Hurtado, 2000). Based on these unique features of human slow life histories, it is not surprising that many fitness-maximizing goals are closely intertwined with familial bonding goals, such as maintaining a committed mating relationship and provisioning protection and care for one's family.

Children across societies are unable to produce the calories they need to consume until they are approximately 15-22 years old. This is relatively late, compared even to our nearest phylogenetic relatives, chimpanzees, who become net producers as early as 5 years of age (Kaplan et al., 2000). The extraordinary resource demands of human children are solved by heavy assistance from parents, older siblings, grandparents, and often other kin (Hill & Hurtado, 2009; Sear & Coall, 2011; Sear & Mace, 2008; Snopkowski & Sear, 2013). Given the long period of juvenile vulnerability and the dependence on the intergenerational transfer of resources and skills from kin, the importance of these kin is clear. Moreover, the extensive cooperative provisioning of young (e.g., alloparenting) eventually increases family members' inclusive fitness—helping one's genetic relatives and their offspring survive and reproduce. Thus, it is unsurprising that one's degree of genetic relatedness to another person predicts one's subjective feelings of closeness and social support with him/her (Laham et al., 2005; Neyer & Lang, 2003), as well as one's level of altruism toward him/her in imagined and real life-threatening situations (Burnstein, Crandall, & Kitayama, 1994; Grayson, 1993; McCullough & Barton, 1991). Despite the fact that extended kinship systems have been reduced by modern mobility, children's developmental delay in providing sufficient energy production to sustain themselves has likely

increased even more with extended adolescence, and with high economic specialization and technological advances that require greater skill acquisition before one becomes productive.

Furthermore, human long-term pair bonds serve to maximize parental investment. Humans are the only great apes that engage in long-term pair bonding (Dixon, 2015). Despite the fact that many societies legally permit men to have more than one wife, most men do not have sufficient resources to attract more than a single wife, and most marriages around the world are monogamous (Henrich, Boyd, & Richerson, 2012). Successful long-term pair-bonding is associated with better physical and psychological well-being for both adults and offspring, perhaps because it allows greater total investment in shared offspring via division of labor and mutual support (Conroy-Beam, Goetz, & Buss, 2015; Durante, Eastwick, Finkel, Gangestad, & Simpson, 2016; Finkel & Eastwick, 2015).

Mate-seeking is thus only one step in a long pathway toward successful reproduction, and that step is typically followed by large investments in maintaining a long-term, committed mating relationship. Unlike mate-seeking, which is a goal that can be “checked off” once a person finds a mate, retaining a mate requires continued investment for years and even decades. Indeed, research suggests that once people form pair-bonds, they allocate resources away from seeking new mating partners and more toward maintaining their existing relationships (Neel et al., 2016). Compared with single individuals, those in long-term relationships pay less attention to attractive alternative partners (Miller, 1997) and are more likely than single individuals to downplay the attractiveness of alternatives (Johnson & Rusbult, 1989; Lydon, Meana, Sepinwall, Richards, & Mayman, 1999; Simpson, Gangestad, & Lerma, 1990), while adopting a positive bias toward their own partner (Fletcher & Kerr, 2010).



Moreover, human males generally contribute heavily toward the provisioning of their partner and offspring (Geary & Flinn, 2001)—contrary to the general mammalian pattern in which paternal investment is found in less than 5% of species (Clutton-Brock, 1989). All female mammals make an initially higher caloric investment in offspring, via gestation and nursing, than do males. However, the sex difference in overall parental investment is much smaller in humans than in other mammals, given that both males and females invest heavily in caring for their children long after the infant is weaned. This cooperative biparental investment significantly increases the fitness of offspring (Geary, 2000, 2005). For instance, father presence triples the probability of child survival from illness and reduces the risk of children being murdered in hunter-gatherer small-scale societies (Hurtado & Hill, 1992; Winking, Gurven, & Kaplan, 2011). Paternal investment of time and financial resources is also related to upward social mobility of children, even when maternal characteristics are controlled for (Kaplan, Lancaster, & Anderson, 1998). Conversely, divorce in Western countries predicts various negative outcomes for children, including lower educational attainment, more aggression, more substance abuse, and greater depression (Barber & Demo, 2006).

Besides the fact that human males invest more in offspring than do typical mammals, human females are also unique among mammals, in that they often live decades beyond the complete senescence of child-bearing capacities (Caro et al., 1995; Pavelka & Fedigan, 1991). Across cultures, postmenopausal women contribute a significant amount of resources toward the fitness of their children and grandchildren, by helping with childcare and transferring knowledge and skills (Hawkes, 2004). Research shows that a mother living past the age of menopause is associated with fitness benefits for her offspring, independent of levels of wealth. The lifetime reproductive success of women with contributing mothers is enhanced through the daughter's

ability to have children sooner and at shorter intervals, and to raise more of them to adulthood (Lahdenperä, Lummaa, Helle, Tremblay, & Russell, 2004).

### **Existing research on long-term familial bonds**

Because we found, in several data sets from many different countries, that mate-seeking motives were generally given the lowest priority and mate retention and kin care the highest priority (Figure 1), we have been suggesting that social psychologists, especially those adopting an evolutionary perspective (see Figure 3), would do well to consider reallocating the relative amount of attention to those different topics. This should not be taken to suggest that psychologists have given no attention to topics of mate retention and kin care. Indeed, although social psychologists during the 1970s “focused almost entirely on attraction between strangers in short-term laboratory contacts” (Huston & Levinger, 1978, p. 116; see similar concerns from Hogan & Emler, 1978), critiques at that time led to the development of the field of interpersonal relationships, which has extensively examined long-term relationships (as well as initial partner choice, dating, and relationship formation). Work in that area has contributed to a better understanding of the factors that keep couples together, such as forgiveness (e.g., Braithwaite, Selby, & Fincham, 2011; McCullough, Worthington Jr., & Rachal, 1997), gratitude (Algoe, Gable, & Maisel, 2010), mindfulness (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007), and trust (e.g., Rempel, Holmes, & Zanna, 1985). Other research in this area has explored factors that predict relationship dissolution (Le, Dove, Agnew, Korn, & Mutso, 2010; Simpson, 1987), such as inability to control impulses (Kelly & Conley, 1987) and infidelity (Hall & Fincham, 2006; Shackelford, Buss, & Bennett, 2002). Yet other work has explored the effects of family origins on adults’ current romantic relationships, including effects on romantic commitment and conflict resolution behaviors (Conger, Cui, Bryant, & Elder, Jr., 2000; Donnellan, Larsen-Rife,

& Conger, 2005; Koerner & Fitzpatrick, 2002; Reese-Weber & Bartle-Haring, 1998; Weigel, Bennett, & Ballard-Reisch, 2003), how mother-infant attachment affects later attachment styles with romantic partners in adulthood (Fraley, 2002; Simpson, Collins, Tran, & Haydon, 2007; Simpson & Rholes, 2012), and the dynamics of people's relationships with their parents and siblings (Buhrmester & Furman, 1990; Cicirelli, 2013; Lamb & Sutton-Smith, 2014; Lawton, Silverstein, & Bengtson, 1994; Lye, 1996; Stocker, Lanthier, & Furman, 1997; White, 2001).

Bowlby's (1969) classic ideas about mother-infant attachment have been the most influential evolutionarily-oriented concepts in the area of close relationships (Brennan & Shaver, 1995; Fraley & Davis, 1997; Hazan & Shaver, 1987; Simpson, 1990). However, there are many other connections that could be made between findings in humans and in other species (Hrdy, 2007; Silk, Alberts, & Altman, 2003), and with evolutionary theories about family relationships (Michalski & Euler, 2008; Trivers, 1974). Hence, an integration with the broader range of potentially relevant comparative and evolutionary research and theory could be quite productive. For example, emotions research on *nurturant love* suggests that it activates a suite of physiological, cognitive, and behavioral changes that facilitate long-term familial bonds motivation (O'Neil, Danvers, & Shiota, 2018; Shiota et al., 2014, 2017). Specifically, in response to big eyes, large foreheads, and other functionally diagnostic cues of infancy (Glocker, Langleben, Ruparel, Lougehead, Gur, & Sachser, 2009; Lorenz, 1943; Sherman et al., 2009; Zebrowitz & Montepare, 2008), people display a distinct and recognizable "cuteness expression" potentially to communicate one's kin care motivation to others (O'Neil, Shiota, Danvers, & Hu, 2019).

There is extensive research on how close relationships and parenting affect psychological well-being. It has been found, for example, that establishing and maintaining an intimate

committed relationship (e.g., marriage, cohabitation) robustly boosts one's well-being (Diener, Gohm, Suh, & Oishi, 2000; Lucas, Clark, Georgellis, & Diener, 2003; Luhmann, Hofmann, Eid, & Lucas, 2012; Stutzer & Frey, 2006). On the other hand, some research suggests decreased well-being as a function of parenting (Campbell, Converse, & Rodgers, 1976; Evenson & Simon, 2005; Glenn & McLanahan, 1982; Glenn & Weaver, 1979; McLanahan & Adams, 1987), while other research suggests increased well-being (Aassve, Goisis, & Sironi, 2012; Ballas & Dorling, 2007; Herbst & Ifcher, 2016; Nelson, Kushlev, English, Dunn, & Lyubormirsky, 2013)—a phenomenon known as “the parenthood paradox” (Baumeister, 1991).

Researchers in the field of developmental psychology have directed a great deal of attention to relationships between parents and children, with particular focus on how parents' behaviors influence children's behavioral and psychological outcomes (e.g., Abidin, 1992; Ainsworth, 1979; Amato & Fowler, 2002; Baydar & Brooks-Gunn, 1991; Bornstein, 2002; Bowlby, 2008). For instance, family environment in early childhood predicts long-term effects on self-esteem (Orth, 2018) and prosocial behavior (Knafo & Plomin, 2006), while positive maternal-infant attachment enhances a child's development and ability to explore the world from a secure emotional foundation (Flaherty, & Sadler, 2011). Also, there is a great deal of research on the effects of parental divorce on children's psychological and cognitive functioning (Demo & Acock, 1988; Guidubaldi, Cleminshaw, Perry, & McLoughlin, 1983; Shulman, Scharf, Lumer, & Maurer, 2001; Teachman & Paasch, 1994; Wallerstein & Lewis, 1998). Most of the findings in developmental psychology have yet to be integrated within a broader evolutionary perspective, but there have been promising connections made in recent years. Such an integration could help provide a cohesive framework linking developmental and social psychology with one another, and with developments in other fields such as biology and anthropology (e.g., Ellis,

Figueredo, Brumbach, & Schlomer, 2009; Sng, Neuberg, Varnum & Kenrick, 2017; Sng et al., 2018). It could, in addition, generate a number of new research avenues into topics that are of central importance to people's everyday lives.

Further, there is emerging evidence supporting biological mechanisms that promote bonding and caregiving behaviors that eventually facilitate long-term familial bonds. For instance, oxytocin, which is released during childbirth and nursing, has been found to be crucial for facilitating maternal bonding and caregiving (Carter, 2014; Galbally, Lewis, IJzendoorn, & Permezel, 2011; Leng, Meddle, & Douglas, 2008; Levine, Zagoory-Sharon, Feldman, & Weller, 2007). In a related vein, men who invested in long-term familial bonds maintain decreased levels of testosterone compared to unpaired men or those who retain extra-pair mating interest (e.g. Alvergne et al. 2009; Burnham et al., 2003; Edelstein et al., 2011; Gray & Campbell 2009; Gray, Kahlenberg, Barrett, Lipson, & Ellison, 2002; Hooper, Gangestad, Thompson, & Bryan, 2011; Muller, 2017). Those men who are relatively more interested in babies, for example, had relatively lower testosterone reactivity to cues of short-term mating (Zilioli et al., 2015). Conversely, men with high levels of testosterone were found to be more interested in extra-pair affairs (Edelstein, Chopik, & Kean, 2011; McIntyre, Gangestad, Gray, Chapman, Burnham, O'Rourke, & Thornhill, 2006), while being less interested in infant-relevant stimuli (Fleming, Corter, Stallings, & Steiner, 2002; Roney, Hanson, Durante, & Maestripieri, 2006.; Storey, Walsh, Quinton, & Wynne-Edwards, 2000.; Weisman, Zagoory-Sharon, & Feldman, 2014), and families and parenting (Alvergne, Faurie, & Raymond, 2009; Mascaro, Hackett, & Rilling, 2013).

Recently, Schaller (2018) has noted that a number of less obvious implications follow from a consideration of parent-child relationships using an evolutionary perspective. For

example, in line with the idea that one important function of parental caregiving is the protection of vulnerable children from sources of danger, activating kin care motivation has been found to increase both parents' and non-parents' hypervigilance to potential threats, such as menacing formidable men or members of out-group (Fessler, Holbrook, Pollack, & Hahn-Holbrook, 2014; Gilead & Liberman, 2014). Activating parenting motivation has also been found to lead to greater aversion to risk (Eibach & Mock, 2011; Sherman, Haidt, & Coan, 2009). Additionally, kin care motivation also leads to greater moral vigilance, increased perception of threat in the environment, and more social conservatism (Kerry & Murray, 2018; Kerry & Murray, 2019) as well as harsher moral judgments (Buckels et al., 2015; Chapman & Anderson, 2014; Eibach, Libby, & Ehrlinger, 2009), in line with the stereotypical assumptions that people who violate moral norms may pose an indirect threat to both oneself and offspring.

### **Empirical implications and future research directions.**

If people are generally more motivated toward tending to long-term relationships and caring for family members than to initiating such relationships and seeking immediate sexual gratification, this has a number of implications for human psychology, not all of which have been fully explored, yet.

First, evolutionary psychology and close relationship research could benefit from greater interaction. Sometimes evolutionary psychologists have generated research relevant to close relationships, but have emphasized the implications for short-term relationships and attraction, rather than implications for long-term bonds. For example, research on men's preferences for relatively small waist and larger hips (i.e., an hourglass- rather than pear-shaped figure) has been interpreted in terms of its implications for attraction towards women who are maximally fertile and healthy, which would imply that if a man had a sexual relationship with a woman with a low

waist-to-hip ratio (i.e., more hourglass-like) she would be maximally capable of bearing his child, and possessed of sufficient body fat to support the young infant's nutritional needs (Grammer, Fink, Moller, & Thornhill, 2003; Marlowe, Apicella, & Reed, 2005; Pawlowski & Dunbar, 2005; Singh, 1993a, 1993b, 2002, 2006; Singh & Singh, 2011; Sugiyama, 2005; Weeden & Sabini, 2005). But research reviewed more recently by Lassek and Gaulin (2018a, 2018b, 2019) has indicated that low waist-to-hip ratios or low body mass indices (BMI) are not actually positively indicative of fertility or health; indeed, they seem to be negatively related. However, a low waist-to-hip ratio and low BMI is strongly associated with youth and nubility (Andrews, Lukazweski, Simmons, & Bleske-Recheck, 2017; Fisher 1992; Lassek & Gaulin, 2016, 2018a, 2018b, 2019)—that is, a woman having reached puberty and accumulated the type of body fat (omega 3 fatty acids) that is critical to a child's brain development (and which tends to be deposited on a woman's hips and thighs). This may seem like a fine distinction, but as Lassek and Gaulin point out, these findings actually imply that ancestral males' preferences were prioritizing a woman's long-term reproductive value rather than her immediate fertility, which implies that the mechanism might be designed for facilitating in long-term relationships (Andrews et al., 2017; Buss, 2012; Buss & Schmitt, 1993; Sugiyama, 2005; Symons, 1979). Women show lowest waist-to-hip ratios BMIs a decade before they are maximally fertile, so choosing partners based on these criteria indicates that ancestral males were primarily interested in choosing mates with whom they intended to form long-term bonds (Andrews et al., 2017; Lassek & Gaulin, 2019).

Similarly, consider the research on ovulation and women's sexual desire. Most of the controversy in this area has been with regard to findings suggesting that women who are ovulating become relatively more interested in short-term affairs with men who possess

indicators of “good genes” (with physical characteristics such as symmetry and muscularity) (Gangestad & Thornhill, 2008; Gildersleeve, Haselton, & Fales, 2014; Haselton & Gangestad, 2006; Larson, Haselton, Gildersleeve, & Pillsworth, 2013; Pillsworth & Haselton, 2006a, 2006b; Scheib, Gangestad, & Thornhill, 1999). But it turns out that those effects are controversial, and likely small in any event. What often gets glossed over is the robust finding that normally cycling women (who are not on birth control) do in fact increase their interest in sex while they are ovulating, and most typically direct that sexual interest toward their long-term partners (Roney & Simmons, 2016; Arslan, Schilling, Gerlach, & Penke, 2018). Most women are unaware when they are ovulating, so this is not a conscious decision, but it is critically important from an evolutionary perspective because it does indicate that human females are (often unintentionally) acting in ways that are designed to increase the odds of reproduction with their existing partners (Roney & Simmons, 2013). And although it may be less sensational than findings that they might or might not be more likely to have extramarital affairs while ovulating, it is equally newsworthy that they most likely increase sexual contact with their long-term partners.

Social and evolutionary psychologists have learned a great deal about what traits and characteristics humans find attractive in the opposite sex. A better understanding of kin care motivation might have implications for understanding mate attraction behaviors and related cognitive processes. For example, mate choice decisions and romantic attraction seem to be affected by parents, given that arranged marriage is common in many societies including hunter-gather cultures (Buunk, Park, & Duncan, 2010; Walker, Hill, Flinn, & Ellsworth, 2011). There is research suggesting that parent and offspring place importance on similar traits in a long-term partner (Apostolou, 2010; Perilloux, Fleischman, & Buss, 2011). Far less has been found on how



pressures to find a partner faster or slower than close-aged siblings might change our mate-seeking psychology, or how family pressures to settle down and commit to current partners might affect who we decide to eventually marry. These questions may play a role in explaining the differences between an individual's "ideal" mate and the mate he or she eventually attracts and commits to. Although these questions remain relatively understudied, several researchers have begun to investigate these types of issues, yielding a number of interesting findings (Apostolou, 2010; Buunk, Park, & Duncan, 2010; Conroy-Beam & Buss, 2016a, 2016b; Kalmijn, Liefbroer, Van Poppel, & Van Solinge, 2006; Mok, 1999; Scelza, 2013; Walker, Hill, Flinn, & Ellsworth, 2011).

The current findings also raise a number of interesting questions for the field of consumer psychology. Past research has indicated that consumer spending and monetary decisions are often related to mate-seeking effort (Griskevicius et al., 2007), leading to, for example, greater conspicuous consumption among men interested in short-term relationships (Sundie et al., 2011). Much marketing is focused on the "sex sells" strategy, reflecting that it immediately grabs the attention. However, given that most people most of the time are not prioritizing mate-seeking motivation, these techniques might be potentially operating on a more peripheral route to persuasion. It's not yet clear whether the "sex sells" strategy is actually most effective at influencing consumer behavior *after* initially grabbing one's attention. Kin care-focused techniques might more frequently target a more central route to persuasion, possibly leading to longer-lasting or more effective behavioral change in sales. Furthermore, long-term familial bonds might also influence people's other economic decisions, such as saving and borrowing, possibly depending on whether they believe they have a financial "safety net" from their kin.

On a broader scale, even though cognitive or behavioral processes might be vastly altered when considering kin relationships and kin care concerns, there has been less attention toward these processes thus far. So far, many foundational social psychological processes have been investigated using interactions between strangers. Given the importance of kin care motivation to individuals across demographics—people around the world of varying sexes, ages, relationship statuses, etc.—it would be worthwhile to consider how interacting with kin and being motivated to care for kin might alter many well-known social psychological phenomena. For example, one study found clear self-serving biases, when people working with online strangers were asked to allocate responsibility for group successes. When participants believed that their online group members were relatives, however, self-serving biases disappeared, and they gave more responsibility for successes to their relatives than to themselves (Ackerman et al., 2007). It would make sense that many other psychological phenomena might be very different when interacting with kin. For example, social comparison with a committed partner or family member might differentially affect people's mood and motivation compared to social comparison with strangers or acquaintances (e.g., Collins, 1996). To the extent that one's own outcomes are improved through the success of one's kin, it makes sense that close kin's success leads less to unpleasant social comparison and more to positive feelings of "basking in reflected glory" (Cialdini, Borden, Thorne, Walker, Freeman, & Sloan, 1976; Tesser, 1988). In another example, compliance and obedience tactics might differ within families and, in turn, produce different results. Given the importance of long-term familial bonds, perhaps attempts at compliance and obedience induce greater behavior change and/or result in more persuasion (i.e., changes in beliefs), when coming from a family member compared to a stranger. Alternatively, people may

have an easier time saying “no” to their relatives, or compliance and obedience effects may reverse for different types of relatives (siblings compared to grandparents, for example).

As an additional example, patterns of aggression and violence might be different when people are interacting with kin as compared to strangers or acquaintances, and with genetically related as compared to unrelated kin. Family members and relatives often come into conflict. People frequently argue with their parents and engage in minor physical altercations with their siblings (Jensen-Campbell & Graziano, 2000). Yet although criminologists have often pointed to the home as the place where homicides are most likely to occur, the vast majority of domestic homicides occur between spouses (who are not genetically related) or unrelated people living together (Daly & Wilson, 1997). Further, although there are occasional murders committed by biologically related parents and siblings, they are vastly outnumbered by violent crimes committed by step-relatives. Thus, despite the frequency of conflicts between relatives, and the readiness to disagree with them over everyday matters, there seem to be strong evolved checks on levels of violence between biological relatives that are not found in interactions with non-kin. How do people manage their everyday conflicts with kin (and non-kin), and what individual differences and circumstances explain the rare instances when checks on violence are overridden?

We also believe that evolved influences on familial motivations and behaviors are likely to interact in theoretically sensible, and potentially interesting, ways with variations in local cultural ecology (Sng et al., 2018). How resources are allocated to parenting, for example, varies across cultures in ways that may well be systematically linked to ecological factors. And it is known that both men and women systematically alter their parental effort (e.g., breastfeeding, parent-child co-sleeping) based on environmental hazards such as pathogen, warfare, and famine

(Quinlan, 2007). Future research could consider other cultural factors, such as laws directly regulating investment in existing offspring and former partners (e.g., child support and alimony laws), as well as ecological factors, including mortality rate, pathogen prevalence, or sex ratio, that can give rise to different patterns of paternal investment, as found in societies of lowland South America with the belief of partible (shared) paternity (Mesoudi & Laland, 2007; Walker, Flinn, & Hill, 2010). Moreover, although most of the data we presented in this paper came from countries that enforce monogamy, it would be interesting to investigate whether the pattern of results differ in polygynous societies, in which explicit mate-seeking efforts are allowed to continue even after having secured a long-term committed partner. One line of evidence suggests that we might observe such differences, especially in the developmental trajectory of mating and parenting motives, in the association between testosterone and mating strategies. As testosterone plays a role in regulating the trade-off between mating and parenting efforts, this association in polygynous societies may depend on men actually having multiple partners (Alvergne et al., 2009; Gray, 2003), as well as how much care they provide for their children (Muller, Marlowe, Bugumba, & Ellison, 2009), which may in turn be linked to ecological contexts (Marlowe, 2000) such as the mode of subsistence (e.g., foragers versus pastoralists).

### **Links between the fundamental motives approach and other approaches to motivation**

The findings we have been discussing were incidental byproducts of a broader program of research into what we have been calling “fundamental social motives.” It is important to note that these motives are considered “fundamental” in the particular sense of being linked to domain-specific tasks that our human ancestors would have confronted more or less regularly, and whose solutions would have influenced their reproductive success (Schaller et al., 2010, 2017). This approach is not meant to supersede other approaches that focus on a) motivational

distinctions that are typically more domain-general, such as intrinsic versus extrinsic, prevention versus promotion, or approach versus avoidance (e.g., Elliot, 2006; Kasser, 2002; Ryan & Deci, 2000; Schwartz, 1992; Sheldon, 2007), or b) uniquely human needs such as existential meaning or self-actualization (King, Hicks, Krull, & Del Gaiso, 2006; Maslow, 1943; Ryan & Deci, 2001). Indeed, there are likely to be interesting questions at the interface of our approach and these other approaches to human motivation.

Our proposed hierarchy of fundamental social motives is theoretically derived from an expanded evolutionary life history perspective (Kenrick et al., 2010; Schaller et al., 2017; Stearns, 1992). When a life history approach is applied to other animal species, it implicitly assumes a developmental hierarchy of goals—for example, animals must first deal with somatic needs (prioritizing behaviors that develop and maintain their own bodies) before they move on to mating (choosing mates as well as acting in ways that attract those mates). In the case of some animal species, but not all, this is followed by investment in parenting effort (directing energy and resources to raising offspring to the point of independence). Our model further subdivides the particular developmental tasks that human beings face: Because human offspring are especially helpless and benefit from biparental care, humans, unlike the majority of other mammals, not only invest energy in attracting mates, but also in maintaining relationships with those mates. Because ours is a social species, and our ancestors lived most of their lives in small groups of familiar others, and because those groups often involve distinctions in status, we also have distinct cognitive/affective systems for dealing with affiliative and status-linked opportunities and threats.

How do other motivational approaches fit with this perspective? One simple answer is that they are working at a different level of analysis, but there are probably more interesting

answers, not all of which are yet worked out. Distinctions between extrinsic versus intrinsic motivation and promotion and prevention are more domain-general, in the sense that they apply to many of these life history goal systems rather than mapping on in a simple one-to-one fashion. Consider mate-retention, which can involve intrinsic and promotion-oriented goals, such as wanting to spend time with one's partner on a vacation, as well as extrinsic and prevention-oriented goals, such as a jealous desire to stop one's partner from flirting with a potential romantic interloper. Either prevention or promotion oriented goals could be further subdivided into those that are intrinsic or extrinsic (buying one's partner an anniversary gift because you really desire to see him or her happy, versus remembering that he or she has hinted strongly that you'd better not forget).

In much of the research described above, we asked people which life history goals they found most important in their lives. We did not ask about whether those goals were experienced as intrinsically- vs. extrinsically-motivated, or designed to prevent bad outcomes vs. approach good ones. Because intrinsic motives have been found to be associated with well-being (Kasser & Ryan, 1993; Sheldon & Kasser, 1995), perhaps one can infer that our participants experienced mate search and breakup goals as largely extrinsic, and mate-retention and kin-care goals as largely intrinsic. This certainly seems to apply in a straightforward way to breakup concern, which is hard to imagine as being an intrinsically desirable goal about which to obsess. Perhaps many people also experience mate-seeking as an extrinsic activity, involving an attempt to please and attract others by altering one's appearance and presenting oneself for evaluation. This is not a perfect correspondence, of course, because mate-seeking motives are also associated with sexual arousal (Beall & Tracy, 2017), which can certainly, for at least some of the people some of the time, be an intrinsically desirable goal. Indeed, the proximal goals involved in seeking a

new mate might include trying to satisfy one's sexual urges, a desire for companionship, a desire for material goods, a desire to please one's parents, or all of the above. Thus, the fundamental social motives cannot be neatly reduced to internally vs. externally driven motives, although it may be theoretically interesting to see how these types of motivational systems interact. For instance, it seems likely that there are individual differences and situational factors that alter one's perspective on mate search, and that those who are experiencing it as more of a self-presentational and extrinsic activity are the ones for whom it is associated with anxiety and depression. Certainly, then, many interesting questions could follow by considering how other domain-general aspects of motivation interact with each of the life history domains we have been discussing here.

As indicated above, there is also research linking fundamental social motives to eudaimonic well-being and self-actualization (Krems et al., 2017), and there are no doubt many other interesting questions at the interface of evolutionary and humanistic approaches to well-being.

### **Conclusion: Not a crisis, but an opportunity to balance investments**

Social psychologists seem to have a special affinity for identity crises, and every few years there is a call to reconsider whether we are doing everything completely wrong. In 1967, Kenneth Ring harshly critiqued the field as focusing on "fun and games" and shallow theory testing instead of systematic inquiry into problems of broad social significance. His critique helped trigger a massive "crisis of confidence in social psychology," with questions not only about irrelevance but also about the lack of comprehensive theory (Elms, 1975; Pepitone, 1976; Sampson, 1978). Two decades after Ring's criticisms, Carlson (1987) leveled a strong critique against personality and social psychology for, among other things, failing to study meaningful

social groups. Several researchers pointed out the limitations of focusing our research on college students (e.g., Hogan & Emler, 1978; Sears, 1986). Fast forward another two decades, and Henrich, Heine, and Norenzayan (2010) advanced arguments that psychologists have focused their efforts on “the weirdest people in the world” (participants from samples living in Western, Educated, Industrialized, Rich, and Democratic [WEIRD] societies). In parallel, there has been much recent debate about whether the findings of laboratory studies are reliable and replicable (e.g., Spellman, 2015).

The results we have discussed here are relevant to many of those earlier self-examinations. The findings we presented address the question of what people find naturally relevant to their everyday lives, they are linked to broad and important theoretical questions, and the results certainly pass the test of replicability and cross-cultural reliability, showing up in samples not only from European and North American countries, but also in Bolivia, Brazil, Uganda, and Thailand, among others.

Rather than sounding the alarm for another crisis, however, we would suggest a more measured response—akin to a middle-aged parent’s redistribution of their investment portfolio rather than a teenager’s rebellion or a midlife career change and move to Tahiti. Following the early critiques about social psychology as the study of relationships between strangers in the lab, as we noted, there has emerged a substantial literature on relationships, which is directly relevant to the goal of maintaining long-term romantic relationships (e.g., Aron, Aron, Tudor, & Nelson, 1991; Berscheid & Reis, 1998; Bradbury & Fincham, 1988; Collins & Feeney, 2000; Drigotas & Rusbult, 1992; Reis & Rusbult, 2004; Rempel, Holmes, & Zanna, 1985; Van Lange et al., 1997). As we also noted earlier, most of this research deals with the topic of mate retention, and there has been relatively less investment in understanding the various facets of social relationships



between siblings, children and parents, grandparents and their descendants, or cousins.

Psychologists adopting an evolutionary perspective have been perhaps most prone to emphasize sexual attraction (Webster et al., 2009), amply demonstrating the predictive power of theories of sexual selection and differential parental investment (e.g., Kenrick et al., 1990). However, several evolutionarily-oriented psychologists have also begun to study social relationships within the family (e.g., Lieberman, Tooby, & Cosmides, 2007; Laham et al., 2005; Park, Schaller, & Van Vugt, 2008; Salmon & Shackelford, 2007).

In order to develop a more balanced portfolio of investments, then, we would not suggest that social psychologists abandon the study of phenomena related to sexual attraction and mate choice, given that such topics are not only important but intrinsically attention-grabbing (Maner et al., 2003). However, allocation of research effort to the various ways in which social relationships and social cognitions unfold within the family context might pay off well, given that there are so many unexplored questions remaining to be asked, and answered, within this centrally important domain.

## References

- Aassve, A., Goisis, A., & Sironi, M. (2012). Happiness and childbearing across Europe. *Social Indicators Research*, 108, 65-86.
- Abbot, P., Abe, J., Alcock, J., Alizon, S., Alpedrinha, J. A., Andersson, M., ... & Barton, N. (2011). Inclusive fitness theory and eusociality. *Nature*, 471(7339), E1.
- Abidin, R. R. (1992). The determinants of parenting behavior. *Journal of Clinical Child Psychology*, 21, 407-412.
- Ackerman, J. M., Kenrick, D. T. & Schaller, M. (2007). Is friendship akin to kinship? *Evolution & Human Behavior*, 28, 365-374.
- Ainsworth, M. S. (1979). Infant–mother attachment. *American Psychologist*, 34, 932-937.
- Algoe, S. B., Gable, S. L., & Maisel, N. C. (2010). It's the little things: Everyday gratitude as a booster shot for romantic relationships. *Personal Relationships*, 17(2), 217-233.
- Alvergne, A., Faurie, C., & Raymond, M. (2009). Variation in testosterone levels and male reproductive effort: Insight from a polygynous human population. *Hormones and Behavior*, 56(5), 491-497.
- Amato, P. R., & Fowler, F. (2002). Parenting practices, child adjustment, and family diversity. *Journal of Marriage and Family*, 64, 703-716.
- Anderson, U. S., Perea, E. F., Becker, D. V., Ackerman, J. M., Shapiro, J. R., Neuberg, S. L., & Kenrick, D. T. (2010). I only have eyes for you: Ovulation redirects attention (but not memory) to attractive men. *Journal of Experimental Social Psychology*, 46, 804-808.
- Andrews, T. M., Lukaszewski, A. W., Simmons, Z. L., & Bleske-Recheck, A. (2017). Cue-based estimates of reproductive value explain women's body attractiveness. *Evolution & Human Behavior*, 38(4), 461-467

- Apostolou, M. (2010). Parental choice: What parents want in a son-in-law and a daughter-in-law across 67 pre-industrial societies. *British Journal of Psychology*, 101, 695-704.
- Apostolou, M. (2010). Parental choice: What parents want in a son-in-law and a daughter-in-law across 67 pre-industrial societies. *British Journal of Psychology*, 101, 695-704.
- Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology*, 60(2), 241-253.
- Ballas, D., & Dorling, D. (2007). Measuring the impact of major life events upon happiness. *International Journal of Epidemiology*, 36, 1244-1252.
- Barber, B. L., & Demo, D. H. (2006). The kids are alright (at least, most of them): Links between divorce and dissolution and child well-being. *Handbook of divorce and relationship dissolution*, 289-311.
- Barnes, S., Brown, K. W., Krusemark, E., Campbell, W. K., & Rogge, R. D. (2007). The role of mindfulness in romantic relationship satisfaction and responses to relationship stress. *Journal of Marital and Family Therapy*, 33(4), 482-500.
- Baumeister, R.F. (1991). *Meanings of life*. New York: Guilford Press.
- Baumeister, R. F., Catanese, K. R., & Vohs, K. D. (2001). Is there a gender difference in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant evidence. *Personality and Social Psychology Review*, 5(3), 242-273.
- Baydar, N., & Brooks-Gunn, J. (1991). Effects of maternal employment and child-care arrangements on preschoolers' cognitive and behavioral outcomes: Evidence from the Children of the National Longitudinal Survey of Youth. *Developmental Psychology*, 27, 932-945.

- Beall, A. T., & Tracy, J. L. (2017). Emotivational psychology: How distinct emotions facilitate fundamental motives. *Social and Personality Psychology Compass*, 11(2), e12303.
- Berscheid, E., & Reis, H. T. (1998). Attraction and close relationships. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 193-281). New York, NY, US: McGraw-Hill.
- Berscheid, E., Dion, K., Walster, E., & Walster, G. W. (1971). Physical attractiveness and dating choice: A test of the matching hypothesis. *Journal of Experimental Social Psychology*, 7(2), 173-189.
- Bowlby, J. (1969). *Attachment and Loss*. New York, NY: Basic Books.
- Bradbury, T. N., & Fincham, F. D. (1988). Individual difference variables in close relationships: A contextual model of marriage as an integrative framework. *Journal of Personality and Social Psychology*, 54(4), 713-721.
- Braithwaite, S. R., Selby, E. A., & Fincham, F. D. (2011). Forgiveness and relationship satisfaction: Mediating mechanisms. *Journal of Family Psychology*, 25(4), 551-559.
- Brennan, K. A., & Shaver, P. R. (1995). Dimensions of adult attachment, affect regulation, and romantic relationship functioning. *Personality and Social Psychology Bulletin*, 21(3), 267-283.
- Buckels, E. E., Beall, A. T., Hofer, M. K., Lin, E. Y., Zhou, Z., & Schaller, M. (2015). Individual differences in activation of the parental care motivational system: Assessment, prediction, and implications. *Journal of Personality and Social Psychology*, 108, 497-514.
- Buhrmester, D., & Furman, W. (1990). Perceptions of sibling relationships during middle childhood and adolescence. *Child Development*, 61(5), 1387-1398.

- Burnham, T. C., Chapman, J. F., Gray, P. B., McIntyre, M. H., Lipson, S. F., & Ellison, P. T. (2003). Men in committed, romantic relationships have lower testosterone. *Hormones and Behavior*, 44(2), 119-122.
- Burnstein, E., Crandall, C. S., & Kitayama, S. (1994). Some neo-Darwinian decision rules for altruism: Weighing cues for inclusive fitness as a function of the biological importance of the decision. *Journal of Personality and Social Psychology*, 67(5), 773-789.
- Buss, D. M. (1994). The strategies of human mating. *American Scientist*, 82(3), 238-249.
- Buss, D. M. (2012). Evolutionary psychology: *The new science of the mind* (3rd ed.). New York: Routledge.
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, 100(2), 204-232.
- Buunk, A. P., Park, J. H., & Duncan, L. A. (2010). Cultural variation in parental influence on mate choice. *Cross-Cultural Research*, 44, 23-40.
- Buunk, B. P., Park, J. H., & Duncan, L. A. (2010). Cultural variation in parental influence on mate choice. *Cross-Cultural Research*, 44, 23-40.
- Byrne, D. (1976). Social psychology and the study of sexual behavior. *Personality and Social Psychology Bulletin*, 3(1), 3-30.
- Byrne, D., Ervin, C. R., & Lamberth, J. (1970). Continuity between the experimental study of attraction and real-life computer dating. *Journal of Personality and Social Psychology*, 16(1), 157-165.
- Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*. New York, NY: Russell Sage Foundation.

- Carlson, R. (1984). What's social about social psychology? Where's the person in personality research? *Journal of Personality and Social Psychology*, 47(6), 1304-1309.
- Caro, T. M., Sellen, D. W., Parish, A., Frank, R., Brown, D. M., Volland, E., & Mulder, M. B. (1995). Termination of reproduction in nonhuman and human female primates. *International Journal of Primatology*, 16(2), 205-220.
- Carter, C. S. (2014). Oxytocin pathways and the evolution of human behavior. *Annual Review of Psychology*, 65, 17-39.
- Chapman, H. A., & Anderson, A. K. (2014). Trait physical disgust is related to moral judgments outside of the purity domain. *Emotion*, 14, 341-348.
- Charnov, E. L. (1993). *Life history invariants: Some explorations of symmetry in evolutionary ecology* (Vol. 6). New York, NY: Oxford University Press.
- Cialdini, R. B., Borden, R. J., Thorne, A., Walker, M. R., Freeman, S., & Sloan, L. R. (1976). Basking in reflected glory: Three (football) field studies. *Journal of Personality and Social Psychology*, 34, 366-375.
- Cicirelli, V. (2013). *Sibling relationships across the life span*. New York, NY: Springer Science & Business Media.
- Clark, R. D., & Hatfield, E. (1989). Gender differences in receptivity to sexual offers. *Journal of Psychology & Human Sexuality*, 2(1), 39-55.
- Clutton-Brock, T. H. (1989). Review lecture: mammalian mating systems. *Proceedings of the Royal Society of London. B. Biological Sciences*, 236(1285), 339-372.
- Collins, N. L., & Feeney, B. C. (2000). A safe haven: An attachment theory perspective on support seeking and caregiving in intimate relationships. *Journal of Personality and Social Psychology*, 78(6), 1053-1073.

- Collins, R. L. (1996). For better or worse: The impact of upward social comparison on self-evaluations. *Psychological Bulletin*, 119, 51-69.
- Conger, R. D., Cui, M., Bryant, C. M., & Elder Jr, G. H. (2000). Competence in early adult romantic relationships: A developmental perspective on family influences. *Journal of Personality and Social Psychology*, 79(2), 224-237.
- Conroy-Beam, D., & Buss, D. M. (2016a). How are mate preferences linked with actual mate selection? Tests of mate preference integration algorithms using computer simulations and actual mating couples. *PLoS ONE*, 11(6), e0156078.
- Conroy-beam, D., & Buss, D. M. (2016b). Do mate preferences influence actual mating decisions? Evidence from computer simulations and three studies of mated couples. *Journal of Personality and Social Psychology*, 111(1), 53–66.
- Conroy-Beam, D., Goetz, C. D., & Buss, D. M. (2015). Why do humans form long-term mateships? An evolutionary game-theoretic model. *Advances in Experimental Social Psychology*, 51(1), 1-39.
- Cunningham, M. R., Druen, P. B., & Barbee, A. P. (1997). Angels, mentors, and friends: Trade-offs among evolutionary, social, and individual variables in physical appearance. *Evolutionary Social Psychology*, 25, 109-140.
- Daly, M., & Wilson, M. (1983). *Sex, evolution, and behavior*. Boston: Willard Grant Press.
- Daly, M., & Wilson, M. (1997). Crime and conflict: Homicide in evolutionary psychological perspective. *Crime and Justice*, 22, 51-100.
- Daly, M., Salmon, C., & Wilson, M. (1997). Kinship: The conceptual hole in psychological studies of social cognition and close relationships. *Evolutionary Social Psychology*, 265-296.

- Dawkins, R. (1979). Twelve misunderstandings of kin selection. *Zeitschrift für Tierpsychologie*, 51(2), 184-200.
- Del Giudice, M., Gangestad, S. W., & Kaplan, H. S. (2015). Life history theory and evolutionary psychology. In D. M. Buss (Ed.), *The handbook of evolutionary psychology* (2nd ed.). New York, NY: Wiley and Sons.
- Demo, D. H., & Acock, A. C. (1988). The impact of divorce on children. *Journal of Marriage and the Family*, 619-648.
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71-75.
- Diener, E., Gohm, C. L., Suh, E., & Oishi, S. (2000). Similarity of the relations between marital status and subjective well-being across cultures. *Journal of Cross-Cultural Psychology*, 31(4), 419-436.
- Dixson, A. (2015). Primate Sexuality. In P. Whelehan & A. Bolin (Eds.), *The International Encyclopedia of Human Sexuality* (First ed). John Wiley & Sons, Ltd.
- Donnellan, M. B., Larsen-Rife, D., & Conger, R. D. (2005). Personality, family history, and competence in early adult romantic relationships. *Journal of Personality and Social Psychology*, 88(3), 562-576.
- Drigotas, S. M., & Rusbult, C. E. (1992). Should I stay or should I go? A dependence model of breakups. *Journal of Personality and Social Psychology*, 62(1), 62-87.
- Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, 30(4), 510-517.



- Eberhard, M. J. W. (1975). The evolution of social behavior by kin selection. *The Quarterly Review of Biology*, 50(1), 1–33.
- Edelstein, R. S., Chopik, W. J., & Kean, E. L. (2011). Sociosexuality moderates the association between testosterone and relationship status in men and women. *Hormones and Behavior*, 60(3), 248–255.
- Eibach, R. P., & Mock, S. E. (2011). The vigilant parent: Parental role salience affects parents' risk perceptions, risk-aversion, and trust in strangers. *Journal of Experimental Social Psychology*, 47(3), 694–697.
- Eibach, R. P., Libby, L. K., & Ehrlinger, J. (2009). Priming family values: How being a parent affects moral evaluations of harmless but offensive acts. *Journal of Experimental Social Psychology*, 45(5), 1160–1163.
- Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation and emotion*, 30(2), 111–116.
- Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009). Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature*, 20(2), 204–268.
- Ellis, B. J., & Symons, D. (1990). Sex differences in sexual fantasy: An evolutionary psychological approach. *Journal of Sex Research*, 27(4), 527–555.
- Elms, A. C. (1975). The crisis of confidence in social psychology. *American Psychologist*, 30(10), 967–976.
- Evenson, R. J., & Simon, R. W. (2005). Clarifying the relationship between parenthood and depression. *Journal of Health and Social Behavior*, 46(4), 341–358.

- Feingold, A. (1992). Gender differences in mate selection preferences: A test of the parental investment model. *Psychological Bulletin*, 112(1), 125-139.
- Fessler, D. M., Holbrook, C., Pollack, J. S., & Hahn-Holbrook, J. (2014). Stranger danger: Parenthood increases the envisioned bodily formidability of menacing men. *Evolution and Human Behavior*, 35(2), 109-117.
- Finkel, E. J., & Eastwick, P. W. (2015). Attachment and pairbonding. *Current Opinion in Behavioral Sciences*, 3, 7-11.
- Fisher, H. (1992). *The anatomy of love*. New York, NY: Norton.
- Flaherty, S. C., & Sadler, L. S. (2011). A review of attachment theory in the context of adolescent parenting. *Journal of Pediatric Health Care*, 25(2), 114-121.
- Fleming, A. S., Corter, C., Stallings, J., & Steiner, M. (2002). Testosterone and prolactin are associated with emotional responses to infant cries in new fathers. *Hormones and behavior*, 42(4), 399-413.
- Fletcher, G. J. O., & Kerr, P. S. (2010). Through the eyes of love: Reality and illusion in intimate relationships. *Psychological Bulletin*, 136, 627-658.
- Fletcher, G. J. O., Thomas, G., Giles, L., Simpson, J. A., Thomas, G., & Giles, L. (1999). Ideals in intimate relationships. *Journal of Personality and Social Psychology*, 76(1), 72-89.
- Fraley, C. R. (2002). Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of developmental mechanisms. *Personality and Social Psychology Review*, 6, 123-151.
- Fraley, R. C., & Davis, K. E. (1997). Attachment formation and transfer in young adults' close friendships and romantic relationships. *Personal Relationships*, 4(2), 131-144.

- Galbally, M., Lewis, A. J., Ijzendoorn, M. V., & Permezel, M. (2011). The role of oxytocin in mother-infant relations: A systematic review of human studies. *Harvard Review of Psychiatry*, 19, 1-14.
- Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and brain sciences*, 23(4), 573-587.
- Gangestad, S. W., & Thornhill, R. (2008). Human oestrus. *Proceedings Biological Sciences*, 275, 991-1000.
- Geary, D. C. (2000). Evolution and proximate expression of human paternal investment. *Psychological Bulletin*, 126(1), 55-77.
- Geary, D. C. (2005). Evolution of Paternal Investment. In D. M. Buss (Ed.), *The handbook of evolutionary psychology* (pp. 483-505). Hoboken, NJ: John Wiley & Sons.
- Geary, D. C., & Flinn, M. V. (2001). Evolution of human parental behavior and the human family. *Parenting*, 1(1-2), 5-61.
- Gettler, L. T., McDade, T. W., Agustin, S. S., Feranil, A. B., & Kuzawa, C. W. (2013). Do testosterone declines during the transition to marriage and fatherhood relate to men's sexual behavior? Evidence from the Philippines. *Hormones and Behavior*, 64(5), 755-763.
- Gildersleeve, K., Haselton, M. G., & Fales, M. R. (2014). Do women's mate preferences change across the ovulatory cycle? A meta-analytic review. *Psychological Bulletin*, 140, 1205-1259.
- Gilead, M., & Liberman, N. (2014). We take care of our own: Caregiving salience increases out-group bias in response to out-group threat. *Psychological Science*, 25(7), 1380-1387.

- Gilovich, T., Keltner, D., Chen, S., & Nisbett, R. (2016). *Social psychology* (4<sup>th</sup> edition). New York: W.W. Norton.
- Glenn, N. D., & McLanahan, S. (1982). Children and marital happiness: A further specification of the relationship. *Journal of Marriage and the Family*, 63-72.
- Glenn, N. D., & Weaver, C. N. (1979). A note on family situation and global happiness. *Social Forces*, 960-967.
- Glocker, M. L., Langleben, D. D., Ruparel, K., Lougehead, J. W., Gur, R. C. & Sachser, N. (2009). Baby schema in infant faces induces cuteness perception and motivation for caretaking in adults. *Ethology*, 115, 256-263.
- Grammer, K., Fink, B., Moller, A. P., & Thornhill, R. (2003). Darwinian aesthetics: Sexual selection and the biology of beauty. *Biological Reviews of the Cambridge Philosophical Society*, 78, 385-407.
- Gray, P. B., Campbell, B. C., (2009. Human male testosterone, pair bonding and fatherhood. In: Gray, P. B., Ellison, P. T. (Eds.), *Endocrinology of Social Relationships*. Harvard University Press, Cambridge MA (pp. 270–293).
- Gray, P. B., Chapman, J. F., Burnham, T. C., McIntyre, M. H., Lipson, S. F., & Ellison, P. T. (2004). Human male pair bonding and testosterone. *Human Nature*, 15(2), 119–131.
- Gray, P. B., Kahlenberg, S. M., Barrett, E. S., Lipson, S. F., & Ellison, P. T. (2002). Marriage and fatherhood are associated with lower testosterone in males. *Evolution and Human Behavior*, 23(3), 193–201.
- Grayson, D. K. (1993). differential mortality and the donner party disaster. *Evolutionary Anthropology*, 2, 151-159.

- Griskevicius, V., Cialdini, R. B., & Kenrick, D. T. (2006). Peacocks, Picasso, and parental investment: The effects of romantic motives on creativity. *Journal of Personality and Social Psychology, 91*, 63-76.
- Griskevicius, V., Goldstein, N. J., Mortensen, C. R., Sundie, J. M., & Cialdini, R. B., Kenrick, D. T. (2009). Fear and loving in Las Vegas: Evolution, emotion, and persuasion. *Journal of Marketing Research, 46*, 384-395.
- Griskevicius, V., Tybur, J. M., Gangestad, S. W., Perea, E. F., Shapiro, J. R., & Kenrick, D. T. (2009). Aggress to impress: Hostility as an evolved context-dependent strategy. *Journal of Personality and Social Psychology, 96*, 980-994.
- Griskevicius, V., Tybur, J. M., Sundie, J. M., Cialdini, R. B., Miller, G. F., & Kenrick, D. T. (2007). Blatant benevolence and conspicuous consumption: When romantic motives elicit strategic costly signals. *Journal of personality and social psychology, 93*(1), 85.
- Guidubaldi, J., Cleminshaw, H. K., Perry, J. D., & McLoughlin, C. S. (1983). The impact of parental divorce on children: Report of the nationwide NASP study. *School Psychology Review, 12*(3), 300-323.
- Hall, J. H., & Fincham, F. D. (2006). Relationship dissolution following infidelity: The roles of attributions and forgiveness. *Journal of Social and Clinical Psychology, 25*(5), 508-522.
- Hamilton, W. D. (1964). The genetical evolution of social behaviour. II. *Journal of Theoretical Biology, 7*(1), 17-52.
- Haselton, M. G., & Gangestad, S. W. (2006). Conditional expression of women's desires and men's mate guarding across the ovulatory cycle. *Hormones and Behavior, 49*, 509-518.
- Hawkes, K. (2004). Human longevity: the grandmother effect. *Nature, 428*(6979), 128-129

- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 52, 511.
- Henrich, J., Boyd, R., & Richerson, P. J. (2012). The puzzle of monogamous marriage. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1589), 657-669.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33(2-3), 61-83.
- Herbst, C. M., & Ifcher, J. (2016). The increasing happiness of US parents. *Review of Economics of the Household*, 14, 529-551.
- Hill, K., & Hurtado, A. M. (2009). Cooperative breeding in South American hunter-gatherers. *Proceedings of the Royal Society B: Biological Sciences*, 276(1674), 3863-3870.
- Hofer, M. K., Buckels, E. E., White, C. J., Beall, A. T., & Schaller, M. (2018). Individual differences in activation of the parental care motivational system: An empirical distinction between protection and nurturance. *Social Psychological and Personality Science*, 9(8), 907-916.
- Hogan, R. T., & Emler, N. P. (1978). The biases in contemporary social psychology. *Social Research*, 478-534.
- Hooper, A. E. C., Gangestad, S. W., Thompson, M. E., & Bryan, A. D. (2011). Testosterone and romance: the association of testosterone with relationship commitment and satisfaction in heterosexual men and women. *American Journal of Human Biology*, 23(4), 553-555.
- Hrdy, S. B. (2007). Evolutionary context of human development: The cooperative breeding model. *Family relationships: An evolutionary perspective*, 39-68.

- Hurtado, A. M., & Hill, K. R. (1992). Paternal effect on offspring survivorship among Ache and Hiwi hunter-gatherers: Implications for modeling pair-bond stability. *Father-child Relations: Cultural and Biosocial Contexts*, 31-55.
- Huston, T. L., & Levinger, G. (1978). Interpersonal attraction and relationships. *Annual review of psychology*, 29(1), 115-156.
- Jensen-Campbell, L. A., & Graziano, W. G. (2000). Beyond the school yard: Relationships as moderators of daily interpersonal conflict. *Personality and Social Psychology Bulletin*, 26(8), 923-935.
- Johnson, D. J., & Rusbult, C. E. (1989). Resisting temptation: Devaluation of alternative partners as a means of maintaining commitment in close relationships. *Journal of Personality and Social Psychology*, 57(6), 967-980.
- Jones, J. H. (2011). Primates and the evolution of long, slow life histories. *Current Biology*, 21(18), R708-R717.
- Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306, 1776-1780.
- Kalmijn, M., Liefbroer, A. C., Van Poppel, F., & Van Solinge, H. (2006). The family factor in Jewish-Gentile intermarriage: A sibling analysis of The Netherlands. *Social Forces*, 84(3), 1347-1358.
- Kaplan, H. S., & Gangestad, S. W. (2015). Life History Theory and Evolutionary Psychology. In D. M. Buss (Ed.), *The Handbook of Evolutionary Psychology* (2nd ed, pp. 68–95). New York, NY: Wiley and Sons.

- Kaplan, H. S., Hill, K., Lancaster, J., & Hurtado, A. M. (2000). A theory of human life history evolution: Diet, intelligence, and longevity. *Evolutionary Anthropology Issues News and Reviews*, 9, 156-185.
- Kaplan, H. S., Lancaster, J. B., & Anderson, K. G. (1998). Human parental investment and fertility: The life histories of men in Albuquerque. In A. Booth & A. C. Crouter (Eds.), *Men in families: When do they get involved? What difference does it make?* (pp. 55-109). Mahwah, NJ: Erlbaum.
- Kasser, T. (2002). *The high price of materialism*. Cambridge, MA: MIT
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, 65, 410-422.
- Kelly, E. L., & Conley, J. J. (1987). Personality and compatibility: A prospective analysis of marital stability and marital satisfaction. *Journal of Personality and Social Psychology*, 52, 27-40.
- Keys, A., Brozek, J., Henschel, A., Mickelsen, O. & Taylor, H. L. (1950) *The Biology of Human Starvation*, Vols. I–II. University of Minnesota Press, Minneapolis, MN.
- Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. Guilford press.
- Kenrick, D. T. (1986). How strong is the case against contemporary social and personality psychology? A response to Carlson. *Journal of Personality and Social Psychology*, 50(4), 839-844.
- Kenrick, D. T., & Cialdini, R. B. (1977). Romantic attraction: Misattribution vs. reinforcement explanations. *Journal of Personality and Social Psychology*, 35(6), 381-391.



- Kenrick, D. T., & Griskevicius, V. (2015). Life history, fundamental motives, and sexual competition. *Current Opinion in Psychology, 1*, 40-44.
- Kenrick, D. T., & Gutierrez, S. (1980). Contrast effects and judgments of physical attractiveness: When beauty becomes a social problem. *Journal of Personality and Social Psychology, 38*(1), 131-140.
- Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in mating strategies. *Behavioral and Brain Sciences, 15*(1), 75-133.
- Kenrick, D. T., & Krebs, J. A. (2018). Well-being, self-actualization, and fundamental motives: An evolutionary perspective. In E. Diener, S. Oishi, & L. Tay (Eds). *e-Handbook of Subjective Well-Being*. NobaScholar.
- Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations. *Perspectives on Psychological Science, 5*(3), 292-314.
- Kenrick, D. T., Groth, G. E., Trost, M. R., & Sadalla, E. K. (1993). Integrating evolutionary and social exchange perspectives on relationships: Effects of gender, self-appraisal, and involvement level on mate selection criteria. *Journal of Personality and Social Psychology, 64*(6), 951-969.
- Kenrick, D. T., Gutierrez, S. E., & Goldberg, L. (1989). Influence of erotica on ratings of strangers and mates. *Journal of Experimental Social Psychology, 25*, 159-167.
- Kenrick, D. T., Li, N. P., & Butner, J. (2003). Dynamical evolutionary psychology: Individual decision-rules and emergent social norms. *Psychological Review, 110*, 3-28.
- Kenrick, D.T., Neuberg, S.L., Cialdini, R.B., & Lundberg-Kenrick, D.E. (2019). *Social psychology: Goals in interaction*. 7<sup>th</sup> edition. Boston: Pearson. In press

- Kenrick, D. T., Neuberg, S. L., Griskevicius, V., Becker, D. V., Schaller, M. (2010). Goal-driven cognition and functional behavior: The fundamental motives framework. *Current Directions in Psychological Science*, 19, 63-67.
- Kenrick, D. T., Sadalla, E. K., Groth, G., & Trost, M. R. (1990). Evolution, traits, and the stages of human courtship: Qualifying the parental investment model. *Journal of Personality*, 58, 97-116.
- Kenrick, D. T., Stringfield, D. O., Wagenhals, W. L., Dahl, R. H., & Ransdell, H. J. (1980). Sex differences, androgyny, and approach responses to erotica: A new variation on the old volunteer problem. *Journal of Personality and Social Psychology*, 38, 517-524.
- Kenrick, D.T., Sundie, J. M. & Kurzban, R. (2008). Cooperation and conflict between kith, kin, and strangers: Game theory by domains. (pp. 353-370) in C. Crawford & D. Krebs (Eds.), *Foundations of Evolutionary Psychology*. NY: Lawrence Erlbaum Associates.
- Kerry, N., & Murray, D. R. (2018). Conservative parenting: Investigating the relationships between parenthood, moral judgment, and social conservatism. *Personality and Individual Differences*, 134, 88-96.
- Kerry, N., & Murray, D. R. (2019). Politics and Parental Care: Experimental and Mediational Tests of the Causal Link Between Parenting Motivation and Social Conservatism. *Social Psychological and Personality Science*.
- Keys, A., Brožek, J., Henschel, A., Mickelsen, O., & Taylor, H. L. (1950). *The biology of human starvation*. (2 Vols.). Oxford, England: Univ. of Minnesota Press.
- King, L. A., Hicks, J. A., Krull, J. L., & Del Gaiso, A. K. (2006). Positive affect and the experience of meaning in life. *Journal of personality and social psychology*, 90(1), 179.

- Knafo, A., & Plomin, R. (2006). Parental discipline and affection and children's prosocial behavior: genetic and environmental links. *Journal of Personality and Social Psychology, 90*(1), 147.
- Ko, A., & Barlev, M. (2019). [Fundamental social motives]. Unpublished raw data, Arizona State University.
- Ko, A., & Suh, E. M. (2019). Does physical attractiveness buy happiness? Women's mating motivation and happiness. *Motivation and Emotion, 34*(1), 1–11.
- Ko, A., Krems, J. A., Peysha, M., & Kenrick, D. T. (2019). [Fundamental social motives and well-being]. Unpublished raw data, Arizona State University.
- Koerner, A. F., & Fitzpatrick, M. A. (2002). You never leave your family in a fight: The impact of family of origin on conflict-behavior in romantic relationships. *Communication Studies, 53*(3), 234-251.
- Krems, J. A., Kenrick, D. T., & Neel, R. (2017). Individual perceptions of self-actualization: what functional motives are linked to fulfilling one's full potential? *Personality and Social Psychology Bulletin, 43*(9), 1337-1352.
- Kwon, J., Barlev, M., Kenrick, D. T., & Varnum, M. E. W. (2019). [Fundamental social motives for social norms]. Unpublished raw data, Arizona State University.
- Laham, S. M., Gonsalkorale, K., & von Hippel, W. (2005). Darwinian grandparenting: Preferential investment in more certain kin. *Personality and Social Psychology Bulletin, 31*, 63–72.
- Lahdenperä, M., Lummaa, V., Helle, S., Tremblay, M., & Russell, A. F. (2004). Fitness benefits of prolonged post-reproductive lifespan in women. *Nature, 428*(March), 178-181.

- Lamb, M. E., & Sutton-Smith, B. (2014). *Sibling relationships: Their nature and significance across the lifespan*. Psychology Press.
- Larson, C. M., Haselton, M. G., Gildersleeve, K. A., & Pillsworth, E. G. (2013). Changes in women's feelings about their romantic relationships across the ovulatory cycle. *Hormones and Behavior*, 63, 128-135.
- Lassek, W. D., & Gaulin, S. J. C. (2016). What makes Jessica Rabbit Sexy? Contrasting roles of waist and hip size. *Evolutionary Psychology*, 14(2), 1-16.
- Lassek, W. D., & Gaulin, S. J. C. (2018a). Do the Low WHRs and BMIs Judged Most Attractive Indicate Higher Fertility? *Evolutionary Psychology*, 16(4), 1-16.
- Lassek, W. D., & Gaulin, S. J. C. (2018b). Do the Low WHRs and BMIs Judged Most Attractive Indicate Better Health? *Evolutionary Psychology*, 16(4), 1-13.
- Lassek, W. D., & Gaulin, S. J. (2019). Evidence supporting nubility and reproductive value as the key to human female physical attractiveness. *Evolution and Human Behavior*.
- Lawton, L., Silverstein, M., & Bengtson, V. (1994). Affection, social contact, and geographic distance between adult children and their parents. *Journal of Marriage and the Family*, 57-68.
- Le, B., Dove, N. L., Agnew, C. R., Korn, M. S., & Mutso, A. A. (2010). Predicting nonmarital romantic relationship dissolution: A meta-analytic synthesis. *Personal Relationships*, 17(3), 377-390.
- Leng, G., Meddle, S. L., & Douglas, A. J. (2008). Oxytocin and the maternal brain. *Current Opinion in Pharmacology*, 8, 731-734.

- Levine, A., Zagoory-Sharon, O., Feldman, R., & Weller, A. (2007). Oxytocin during pregnancy and early postpartum: individual patterns and maternal–fetal attachment. *Peptides*, 28, 1162-1169.
- Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, 82(6), 947-955.
- Li, N. P., & Kenrick, D. T. (2006). Sex similarities and differences in preferences for short-term mates: What, whether, and why. *Journal of Personality and Social Psychology*, 90, 468-489.
- Li, Y. J., Kenrick, D. T., Griskevicius, V., & Neuberg, S. L. (2012). Economic biases in evolutionary perspective: How mating and self-protection motives alter loss aversion. *Journal of Personality and Social Psychology*, 102, 550–561.
- Lieberman, D. (2009). Rethinking the Taiwanese minor marriage data: evidence the mind uses multiple kinship cues to regulate inbreeding avoidance. *Evolution and Human Behavior*, 30(3), 153-160.
- Lieberman, D., Tooby, J., & Cosmides, L. (2007). The architecture of human kin detection. *Nature*, 445(7129), 727-731.
- Lorenz, K. (1943). “Die angeborenen Formen möglicher Erfahrung,” *Zeitschrift für Tierpsychologie*, 5:235–409.
- Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: reactions to changes in marital status. *Journal of Personality and Social Psychology*, 84(3), 527.

- Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: a meta-analysis. *Journal of Personality and Social Psychology, 102*(3), 592.
- Lydon, J. E., Meana, M., Sepinwall, D., Richards, N., & Mayman, S. (1999). The commitment calibration hypothesis: When do people devalue attractive alternatives? *Personality and Social Psychology Bulletin, 25*(2), 152-161.
- Lye, D. N. (1996). Adult child–parent relationships. *Annual Review of Sociology, 22*(1), 79-102.
- Maner, J. K., Kenrick, D. T., & Becker, D. V., Delton, A. W., Hofer, B., Wilbur, C. J., & Neuberg, S. L. (2003). Sexually selective cognition: Beauty captures the mind of the beholder. *Journal of Personality and Social Psychology, 6*, 1107-1120.
- Maner, J. K., Kenrick, D. T., Becker, D. V., Robertson, T. E., Hofer, B., Neuberg, S. L., Delton, A. W., Butner, J., & Schaller, M. (2005). Functional Projection: How Fundamental Social Motives Can Bias Interpersonal Perception. *Journal of Personality and Social Psychology, 88*, 63-78.
- Marlowe, F. (2000). Paternal investment and the human mating system. *Behavioural Processes, 51*(1–3), 45-61.
- Marlowe, F., Apicella, C., & Reed, D. (2005). Men's preferences for women's profile waist-to-hip ratio in two societies. *Evolution & Human Behavior, 26*, 458-468.
- Mascaro, J. S., Hackett, P. D., & Rilling, J. K. (2013). Testicular volume is inversely correlated with nurturing-related brain activity in human fathers. *Proceedings of the National Academy of Sciences, 110*(39), 15746-15751.
- Mazur, A., & Michalek, J. (1998). Marriage, divorce, and male testosterone. *Social Forces, 77*(1), 315-330.

- McCullough, J. M., & Barton, E. Y. (1991). Relatedness and mortality risk during a crisis year: Plymouth Colony, 1620–1612. *Ethology and Sociobiology*, 12, 195–209.
- McCullough, M. E., Worthington Jr., E. L., & Rachal, K. C. (1997). Interpersonal forgiving in close relationships. *Journal of Personality and Social Psychology*, 73, 321–336.
- McIntyre, M., Gangestad, S. W., Gray, P. B., Chapman, J. F., Burnham, T. C., O'Rourke, M. T., & Thornhill, R. (2006). Romantic involvement often reduces men's testosterone levels - But not always: The moderating role of extrapair sexual interest. *Journal of Personality and Social Psychology*, 91(4), 642–651.
- McLanahan, S., & Adams, J. (1987). Parenthood and psychological well-being. *Annual Review of Sociology*, 13, 237–257.
- Mesoudi, A., & Laland, K. N. (2007). Culturally transmitted paternity beliefs and the evolution of human mating behaviour. *Proceedings of the Royal Society B: Biological Sciences*, 274(1615), 1273–1278.
- Michalski, R. L., & Euler, H. A. (2008). Evolutionary perspectives on sibling relationships. In C. Salmon & T. Shackelford (Eds.) *Family relationships: An evolutionary perspective*, 185–204.
- Miller, W. I. (1997). *The anatomy of disgust*. Cambridge, MA: Harvard University Press.
- Mok, T. A. (1999). Asian American dating: Important factors in partner choice. *Cultural Diversity and Ethnic Minority Psychology*, 5, 103–117.
- Muller, M. N. (2017). Testosterone and reproductive effort in male primates. *Hormones and Behavior*, 91, 36–51.

- Muller, M. N., Marlowe, F. W., Bugumba, R., & Ellison, P. T. (2009). Testosterone and paternal care in East African foragers and pastoralists. *Proceedings of the Royal Society B: Biological Sciences*, 276(1655), 347–354.
- Myers, D. G. (2013). *Social psychology* (11<sup>th</sup> ed.). New York, NY: McGraw-Hill.
- Neel, R., Kenrick, D. T., White, A. E., & Neuberg, S. L. (2016). Individual differences in fundamental social motives. *Journal of Personality and Social Psychology*, 110(6) 887-907.
- Nelson, S. K., Kushlev, K., English, T., Dunn, E. W., & Lyubomirsky, S. (2013). In defense of parenthood: Children are associated with more joy than misery. *Psychological Science*, 24(1), 3-10.
- Neyer, F. J., & Lang, F. R. (2003). Blood is thicker than water: Kinship orientation across adulthood. *Journal of Personality and Social Psychology*, 84(2), 310-321.
- O’Neil, M. J., Danvers, A. F., & Shiota, M. N. (2018). Nurturant love and caregiving emotions. In Lench, H. (Ed.) *The Function of Emotions* (pp. 175-193). New York, NY: Springer.
- O’Neil, M. J., Shiota, M. N., Danvers, A. F., & Hu, J. I. (2019). *Prototype facial response to cute stimuli: Expression and recognition*. Manuscript submitted for publication.
- Orth, U. (2018). The family environment in early childhood has a long-term effect on self-esteem: A longitudinal study from birth to age 27 years. *Journal of Personality and Social Psychology*, 114(4), 637.
- Park, J. H., Schaller, M., & Van Vugt, M. (2008). Psychology of human kin recognition: Heuristic cues, erroneous inferences, and their implications. *Review of General Psychology*, 12(3), 215-235.



Pavelka, M. S., & Fedigan, L. M. (1991). Menopause: a comparative life history perspective.

*American Journal of Physical Anthropology*, 34(S13), 13-38.

Pawlowski, B., & Dunbar, R. I. M. (2005). Waist-to-hip ratio versus body mass index as

predictors of fitness in women. *Human Nature*, 16, 164-177.

Pepitone, A. (1976). Toward a normative and comparative biocultural social psychology.

*Journal of Personality and Social Psychology*, 34, 641-653.

Perilloux, C., Fleischman, D. S., & Buss, D. M. (2011). Meet the parents: Parent-offspring

convergence and divergence in mate preferences. *Personality and Individual*

*Differences*, 50, 253-258.

Perilloux, H. K., Webster, G. D., & Gaulin, S. J. (2010). Signals of genetic quality and maternal

investment capacity: The dynamic effects of fluctuating asymmetry and waist-to-hip ratio

on men's ratings of women's attractiveness. *Social Psychological and Personality*

*Science*, 1(1), 34-42.

Pick, C. M., Ko, A., Kenrick, D. T., Suh, E. M., Brandstätter, E. . . . Varnum, M. E. W. (2019)

*Fundamental social motives: A new way to think about culture*. Manuscript in preparation.

Pillsworth, E. G., & Haselton, M. G. (2006a). Women's sexual strategies: The evolution of long-

term bonds and extra-pair sex. *Annual Review of Sex Research*, 17, 59-100.

Pillsworth, E. G., & Haselton, M. G. (2006b). Male sexual attractiveness predicts differential

ovulatory shifts in female extra-pair attraction and male mate retention. *Evolution and*

*Human Behavior*, 27, 247-258.

Quinlan, R. J. (2007). Human parental effort and environmental risk. *Proceedings of the Royal*

*Society Series B*, 274, 121-125.

- Reese-Weber, M., & Bartle-Haring, S. (1998). Conflict resolution styles in family subsystems and adolescent romantic relationships. *Journal of Youth and Adolescence*, 27(6), 735-752.
- Reis, H. T., & Rusbult, C. E. (2004). Close relationships: Key readings. New York: Psychology Press.
- Reis, H. T., Wheeler, L., Spiegel, N., Kernis, M. H., Nezlek, J., & Perri, M. (1982). Physical attractiveness in social interaction: II. Why does appearance affect social experience? *Journal of Personality and Social Psychology*, 43(5), 979-996.
- Rempel, J. K., Holmes, J. G., & Zanna, M. P. (1985). Trust in close relationships. *Journal of personality and social psychology*, 49(1), 95-112.
- Ring, K. (1967). Experimental social psychology: Some sober questions about some frivolous values. *Journal of Experimental Social Psychology*, 3, 113-123.
- Roney, J. R., & Simmons, Z. L. (2013). Hormonal predictors of sexual motivation in natural menstrual cycles. *Hormones and Behavior*, 63, 636-645.
- Roney, J. R., & Simmons, Z. L. (2016). Within-cycle fluctuations in progesterone negatively predict changes in both in-pair and extra-pair desire among partnered women. *Hormones and Behavior*, 81, 45-52.
- Roney, J. R., Hanson, K. N., Durante, K. M., & Maestripieri, D. (2006). Reading men's faces: Women's mate attractiveness judgments track men's testosterone and interest in infants. *Proceedings of the Royal Society B: Biological Sciences*, 273(1598), 2169-2175.
- Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation. *American Psychologist*, 55(1), 68-78.

- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual review of psychology*, 52(1), 141-166.
- Salmon, C. A., & Shackelford, T. K. (Eds.). (2007). *Family relationships: An evolutionary perspective*. Oxford University Press.
- Sampson, E. E. (1978). Scientific paradigms and social values: Wanted—A scientific revolution. *Journal of Personality and Social Psychology*, 36, 1332-1343.
- Scelza, B. A. (2013). Choosy but not chaste: Multiple mating in human females. *Evolutionary Anthropology: Issues, News, and Reviews*, 22, 259-269.
- Schaller, M. (2018). The parental care motivational system and why it matters (for Everyone). *Current Directions in Psychological Science*, 096372141876787.
- Schaller, M., Neuberg, S. L., Griskevicius, V., & Kenrick, D. T. (2010). Pyramid power. *Perspectives on Psychological Science*, 5, 335–337.
- Schaller, M., Kenrick, D. T., Neel, R., & Neuberg, S. L. (2017). Evolution and Human Motivation: A Fundamental Motives Framework. *Social and Personality Psychology Compass*. 11, e12319
- Scheib, J. E., Gangestad, S. W., & Thornhill, R. (1999). Facial attractive-ness, symmetry and cues of good genes. *Proceedings Biological Sciences*, 266, 1913-1917.
- Schmitt, D. P. (2005). Sociosexuality from Argentina to Zimbabwe: A 48-nation study of sex, culture, and strategies of human mating. *Behavior and Brain Science*. 28, 247–275.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, Vol. 25 (pp. 1-65). New York: Academic Press.

Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991).

Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology*, 61(2), 195-202.

Sear, R., & Coall, D. (2011). How much does family matter? Cooperative breeding and the demographic transition. *Population and Development Review*, 37, 81-112.

Sear, R., & Mace, R. (2008). Who keeps children alive? A review of the effects of kin on child survival. *Evolution and Human Behavior*, 29(1), 1-18.

Sears, D. O. (1986). College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *Journal of Personality and Social Psychology*, 51(3), 515-530.

Shackelford, T. K., Buss, D. M., & Bennett, K. (2002). Forgiveness or breakup: Sex differences in responses to a partner's infidelity. *Cognition and Emotion*, 16(2), 299-307.

Sheldon, K. M. (2007). Gender differences in preferences for singles ads that proclaim extrinsic versus intrinsic values. *Sex Roles*, 57(1-2), 119-129.

Sheldon, K. M., & Kasser, T. (1995). Coherence and congruence: Two aspects of personality integration. *Journal of Personality and Social Psychology*, 68, 531-543.

Sherman, G. D., Haidt, J., & Coan, J. A. (2009). Viewing cute images increases behavioral carefulness. *Emotion*, 9, 282-286.

Shiota, M. N., Campos, B., Oveis, C., Hertenstein, M. J., Simon-Thomas, E., & Keltner, D. (2017). Beyond happiness: Building a science of discrete positive emotions. *American Psychologist*, 72(7), 617-643.

- Shiota, M. N., Neufeld, S. L., Danvers, A. F., Osborne, E. A., Sng, O., & Yee, C. I. (2014). Positive emotion differentiation: A functional approach. *Social and Personality Psychology Compass*, 8(3), 104-117.
- Silk, J. B., Alberts, S. C., & Altmann, J. (2003). Social bonds of female baboons enhance infant survival. *Science*, 302(5648), 1231-1234.
- Shulman, S., Scharf, M., Lumer, D., & Maurer, O. (2001). Parental divorce and young adult children's romantic relationships: Resolution of the divorce experience. *American Journal of Orthopsychiatry*, 71(4), 473-478.
- Simpson, J. A. (1987). The dissolution of romantic relationships: Factors involved in relationship stability and emotional distress. *Journal of Personality and Social Psychology*, 53(4), 683-692.
- Simpson, J. A. (1990). Influence of attachment styles on romantic relationships. *Journal of Personality and Social Psychology*, 59(5), 971-980.
- Simpson, J. A., & Rholes, W. S. (2012). Adult attachment orientations, stress, and romantic relationships. In *Advances in Experimental Social Psychology*, Vol. 45 (pp. 279-328). Academic Press.
- Simpson, J. A., Collins, W. A., Tran, S., & Haydon, K. C. (2007). Attachment and the experience and expression of emotions in romantic relationships: A developmental perspective. *Journal of Personality and Social Psychology*, 92, 355-367.
- Simpson, J. A., Gangestad, S. W., & Lerma, M. (1990). Perception of physical attractiveness: Mechanisms involved in the maintenance of romantic relationships. *Journal of Personality and Social Psychology*, 59(6), 1192-1201.

- Simpson, J. A., Gangestad, S. W., Christensen, P. N., & Leck, K. (1999). Fluctuating asymmetry, sociosexuality, and intrasexual competitive tactics. *Journal of Personality and Social Psychology*, 76(1), 159-172.
- Singh, D. (1993a). Adaptive significance of female physical attractiveness, role of waist-hip ratio. *Journal of Personality and Social Psychology*, 65, 293-307.
- Singh, D. (1993b). Body shape and attractiveness: The critical role of waist to hip ratio. *Human Nature*, 4, 297-321.
- Singh, D. (2002). Female mate value at a glance: Relationship of waist to hip ratio to health, fecundity and attractiveness. *Neuroendocrinology*, 23, 81-91.
- Singh, D. (2006). Universal allure of the hourglass figure: An evolutionary theory of female physical attractiveness. *Clinics in Plastic Surgery*, 33, 359-370.
- Singh, D., & Singh, D. (2011). Shape and significance of feminine beauty: An evolutionary perspective. *Sex Roles*, 64, 723-731.
- Smith, J. M. (1964). Group Selection and Kin Selection. *Nature*, 201(4924).
- Sng, O., Neuberg, S.L., Varnum, M.E.W., & Kenrick, D.T. (2017). The crowded life is a slow life: Population density and life history strategy. *Journal of Personality and Social Psychology*, 112, 736-754.
- Sng, O., Neuberg, S.L., Varnum, M. E.W., & Kenrick, D.T. (2018). The behavioral ecology of cultural psychological variation. *Psychological Review*. 125(5), 714-743.
- Snopkowski, K., & Sear, R. (2013). Kin influences on fertility in Thailand: Effects and mechanisms. *Evolution and Human Behavior*, 34(2), 130-138.

- Snyder, M., Tanke, E. D., & Berscheid, E. (1977). Social perception and interpersonal behavior: On the self-fulfilling nature of social stereotypes. *Journal of Personality and social Psychology*, 35(9), 656-666.
- Spellman, B. A. (2015). A Short (Personal) Future history of revolution 2.0. *Perspectives on Psychological Science*, 10(6), 886–899.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092-1097.
- Stearns, S. C. (1992). *The evolution of life histories* (Vol. 249). Oxford, UK: Oxford University Press.
- Stocker, C. M., Lanthier, R. P., & Furman, W. (1997). Sibling relationships in early adulthood. *Journal of Family Psychology*, 11(2), 210-221.
- Storey, A. E., Walsh, C. J., Quinton, R. L., & Wynne-Edwards, K. E. (2000). Hormonal correlates of paternal responsiveness in new and expectant fathers. *Evolution and Human Behavior*, 21(2), 79-95.
- Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *The Journal of Socio-Economics*, 35(2), 326-347.
- Sugiyama, L. S. (2005). Physical attractiveness in adaptationist perspective. In D. M. Buss (Ed.), *Handbook of evolutionary psychology* (pp. 292-343). Hoboken, NJ: John Wiley.
- Sundie, J.M., Kenrick, D. T., Griskevicius, V., Tybur, J., Vohs, K., & Beal, D.J. (2011). Peacocks, Porsches, and Thorsten Veblen: Conspicuous consumption as a sexual signaling system. *Journal of Personality and Social Psychology*, 100, 664-680.
- Symons, D. (1979). *Evolution of human sexuality*. New York, NY: Oxford University Press.

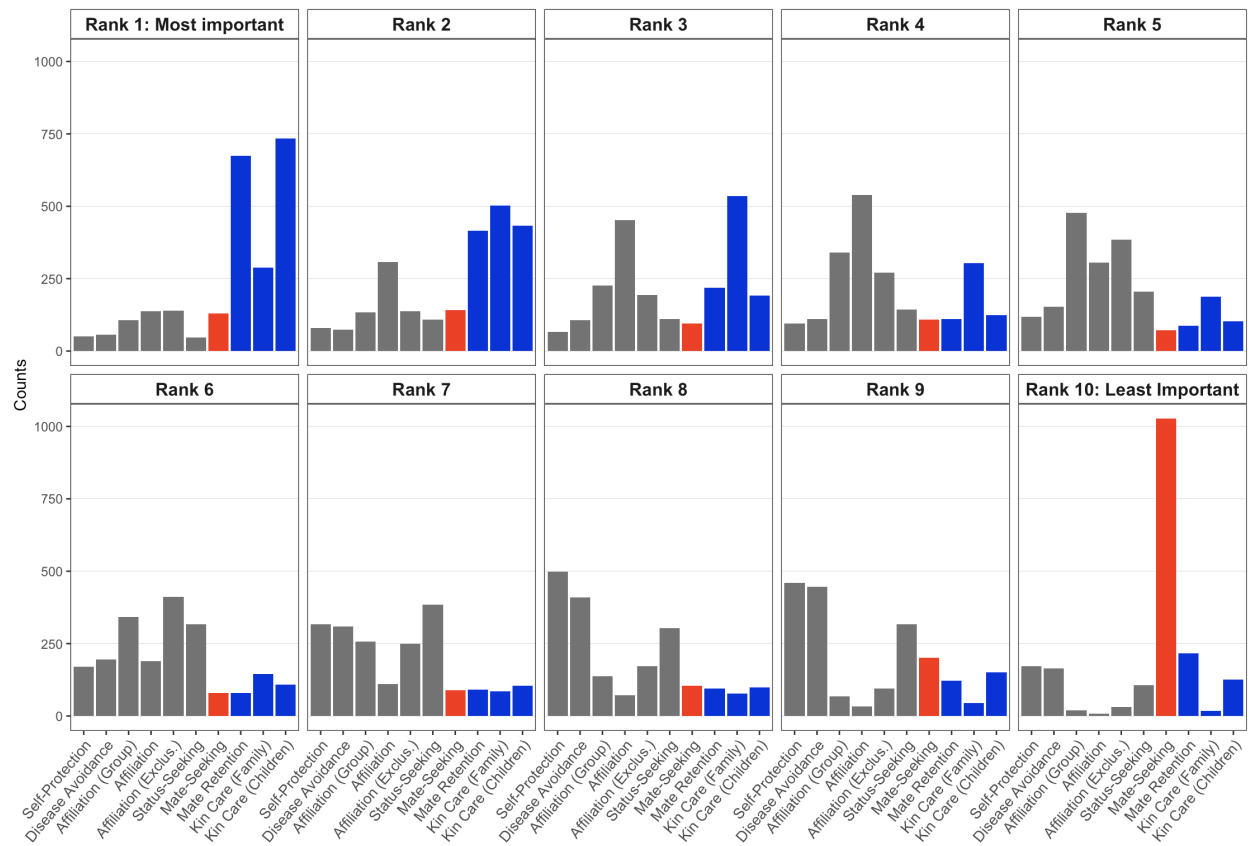
- Teachman, J. D., & Paasch, K. M. (1994). Financial impact of divorce on children and their families. *The Future of Children*, 63-83.
- Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In *Advances in experimental social psychology*, Vol. 21 (pp. 181-227). New York: Academic Press.
- Trivers, R. (1972). Parental investment and sexual selection. In *Sexual Selection & The Descent of Man* (pp. 136-179), New York: Aldine de Gruyter.
- Trivers, R. L. (1974). Parent-offspring conflict. *Integrative and Comparative Biology*, 14(1), 249-264.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive psychology*, 5, 207-232.
- van Anders, S. M., & Watson, N. V. (2007). Testosterone levels in women and men who are single, in long-distance relationships, or same-city relationships. *Hormones and Behavior*, 51(2), 286–291.
- van Anders, S. M., Hamilton, L. D., & Watson, N. V. (2007). Multiple partners are associated with higher testosterone in North American men and women. *Hormones and Behavior*, 51(3), 454-459.
- Van Lange, P. A., Rusbult, C. E., Drigotas, S. M., Arriaga, X. B., Witcher, B. S., & Cox, C. L. (1997). Willingness to sacrifice in close relationships. *Journal of Personality and Social Psychology*, 72(6), 1373-1395.
- Varnum, M. E. W., Kenrick, D. T., Pick, C. M., Ko, A. (2019). [Fundamental social motives and subjective well-being]. Unpublished raw data, Arizona State University.



- Walker, R. S., Flinn, M. V., & Hill, K. R. (2010). Evolutionary history of partible paternity in lowland South America. *Proceedings of the National Academy of Sciences*, 107(45), 19195–19200.
- Walker, R. S., Hill, K. R., Flinn, M. V., & Ellsworth, R. M. (2011). Evolutionary history of hunter-gatherer marriage practices. *PloS one*, 6, e19066.
- Walker, R. S., Hill, K. R., Flinn, M. V., & Ellsworth, R. M. (2011). Evolutionary history of hunter-gatherer marriage practices. *PLoS ONE*, 6, 1-6.
- Wallerstein, J. S., & Lewis, J. (1998). The long-term impact of divorce on children: A first report from a 25-year study. *Family Court Review*, 36(3), 368-383.
- Webster, G. D., Jonason, P. K., & Schember, T. O. (2009). Hot topics and popular papers in evolutionary psychology: Analyses of title words and citation counts in *Evolution and Human Behavior*, 1979–2008. *Evolutionary Psychology*, 7(3), 147470490900700301.
- Weeden, J., & Sabini, J. (2005). Physical attractiveness and health in western societies: A review. *Psychological Bulletin*, 131, 635-653.
- Weigel, D. J., Bennett, K. K., & Ballard-Reisch, D. S. (2003). Family influences on commitment: Examining the family of origin correlates of relationship commitment attitudes. *Personal Relationships*, 10(4), 453-474.
- Weisman, O., Zagoory-Sharon, O., & Feldman, R. (2014). Oxytocin administration, salivary testosterone, and father–infant social behavior. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 49, 47-52.
- West, S. A., & Gardner, A. (2013). Adaptation and Inclusive Fitness. *Current Biology*, 23(13), R577–R584.

- White, A. E., Kenrick, D. T., & Neuberg, S. L. (2013). Beauty at the ballot box: Disease threats predict preferences for physically attractive leaders. *Psychological Science*, 24, 2429-2436.
- White, L. (2001). Sibling relationships over the life course: A panel analysis. *Journal of Marriage and Family*, 63(2), 555-568.
- Winking, J., Gurven, M., & Kaplan, H. (2011). Father death and adult success among the Tsimane: implications for marriage and divorce. *Evolution and Human Behavior*, 32(2), 79-89.
- Zebrowitz, L. A., & Montepare, J. M. (2008). Social psychological face perception: Why appearance matters. *Social and Personality Psychology Compass*, 2(3), 1497-1517.
- Zilioli, S., Ponzi, D., Henry, A., Kubicki, K., Nickels, N., Wilson, M.C., Maestripieri, D., 2015. Interest in babies negatively predicts testosterone responses to sexual visual stimuli among heterosexual young men. *Psychological Science*. 27, 114-118.

## Supplemental Material



**Figure S1.** Full rankings of the relative importance of the ten different fundamental social motives ( $N = 3,214$ ; Ko, Krems, Peysha, & Kenrick, 2019). Displayed from most important (Rank 1) to least important (Rank 10).